Ontario

Ontario Geological Survey
Open File Report 6147

Report of Activities, 2004
Resident Geologist Program

Thunder Bay North Regional
Resident Geologist Report:
Thunder Bay North District

2005

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Thunder Bay North Regional Resident Geologist Report:
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by

M.C. Smyk, G.D. White, M.A. Magee and C. Komar

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Ontario Geological Survey
Regional Resident Geologist Program

Thunder Bay North Regional Resident Geologist (Thunder Bay North District)—2004

by

M.C. Smyk, G.C. White, M.A. Magee and C. Komar

2005

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THUNDER BAY NORTH REGIONAL RESIDENT GEOLOGIST—2004

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INTRODUCTION

The Thunder Bay North District encompasses Lake Nipigon and extends over 500 km north from Highway 11 to the Hudson Bay Lowlands. The following communities are situated within the district: Angling Lake (Wapakeka First Nation (FN)); Armstrong; Beardmore; Bearskin Lake FN; Big Trout Lake (Kitchenuhmaykoosib Inninuwug FN); Cat Lake FN; Fort Hope (Eabametoong FN); Geraldton; Gull Bay FN; Jellicoe; Kasabonika FN; Kingfisher Lake FN; Lansdowne House (Neskantaga FN); Longlac; Macdiarmid; Nakina; North Caribou Lake (Weagamow FN); Osnaburgh House (Mishkeegogamang FN); Pickle Lake; Summer Beaver (Nibinamik FN); Webequie FN and Wunnummin Lake FN.

The authors note that, for ease of reading, all Web addresses were accessed on March 18, 2005, unless otherwise noted . All Universal Transverse Mercator (UTM) co-ordinates are reported in North American Datum 1983 (NAD83), unless otherwise noted.

MINING ACTIVITY

Musselwhite Mine

The **Musselwhite Mine** (Placer Dome Inc. (68%) and Kinross Gold Corporation (32%)) is located 126 km north of Pickle Lake. Access to the mine site is by means of an all-weather airstrip or a 43 km, all-weather gravel road connecting the mine site to the northern extension of Highway 599. Musselwhite is a fly-in operation with pickup points in Thunder Bay and 5 northern communities. The mine employed 307 full-time employees and 108 contract personnel in 2004 (*Inside Musselwhite Mine*, newsletter, v.8, issue 1, Winter 2005). First Nation contractors provide air transportation and camp services (http://www.placerdome.com/operations/musselwhite/musselwhite.html).

The Musselwhite Mine is situated in the North Caribou greenstone belt of the Sachigo Subprovince. Mineralization is predominantly hosted within metamorphosed chemical sedimentary rocks (banded iron formations (BIFs)) and, in particular, within garnet-magnetite-grünerite BIFs (locally termed the Northern Iron Formation). All lithologies have been metamorphosed at middle to upper amphibolite facies (http://www.placerdome.com/operations/musselwhite/musselwhite_geology.html).

In 2004, the mine produced 240 046 ounces of gold from 1.46 mt at a grade of 5.35 g/t Au (A. Cheatle, Placer Dome Inc., personal communication, 2005)(Table 1). Production included 22 000 ounces from the PQ open pit. Mill feed from this pit has high strategic importance in keeping mill capacity full at 4000 tons per day.

Table 1. Mine production and reserves in the Thunder Bay North District in 2004.

Mine	Production to end of 2003		Production in 2004		Reserves at end of 2004 (Proven + Probable @ $350 per ounce gold)	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Musselwhite Mine	8 380 321 t @ ~5.475 g/t Au	1 466 248 ounces gold	1.46 mt @ 5.35 g/t Au	240 046 ounces gold	11 110 000 t	5.532 g/t Au

From 1997 to 2003, 8 380 321 t of ore were mined and milled to produce 1 466 248 ounces of gold (http://www.placerdome.com/operations/musselwhite/musselwhite_mining.html) (A. Cheatle, Placer Dome Inc., personal communication, 2005). Proven and probable ore reserves (at $350 per ounce gold) as of December 31, 2004, were 11 110 000 t at a grade of 5.532 g/t Au, for a total of approximately 1.98 million contained ounces (1.11 million ounces proven and 0.87 million ounces probable) (A. Cheatle, Placer Dome Inc., personal communication, 2005). With current mineral reserves, Musselwhite has an expected mine life projected through to 2013 (http://www.placerdome.com/operations/musselwhite/musselwhite.html).

Exploration at the Musselwhite property continued to focus on the conversion of existing mineral resources to mineral reserves, the extension of known resources and the definition of new "grass roots" prospects (http://www.placerdome.com/operations/musselwhite/musselwhite_expl.html, 2004). To aid this process, particular attention has been paid to understanding the structural architecture of the near-mine area. To this effect, a detailed three-dimensional, lithological and structural model has been developed. All existing infrastructure, resources and reserve models and drill hole databases are included in this interactive model. The model is used on a daily basis to direct and review all exploration. Exploration during 2004 focussed on defining and extending mineral reserves and/or resources at PQ Deeps, Island, Esker South and Esker North. Regional exploration has included work in the Kenpat, Karl Zeemel, Libert Lake, Graf Lake and Ranger South areas.

Four diamond drill rigs tested the PQ Deeps zone parallel to and below the existing mine infrastructure. As part of this program, a new zone on the eastern limb of the T-Antiform was discovered. This zone is effectively an extension to the current S_2 zone (*Inside Musselwhite Mine*, v.7, issue 3, Fall 2004).

Continued success with mineral resources was realized on the PQ Deeps zone to 12,700N, a kilometre ahead of the existing mine reserve blocks. 211 000 new discovery ounces were added to the Inferred Mineral Resource. There is very high confidence that these amounts will be added to reserves and will be drilled from underground in future years (A. Cheatle, Placer Dome Inc., personal communication, 2005). Discoveries associated with the S_2 zone created new potential throughout the mine, very close to existing mine workings, resulting in excellent economics. 162 000 new discovery ounces were added to the Indicated Mineral Resource. In the Jets Zone–Esker North Zone targets were successfully defined, generating 377 663 new discovery ounces at a grade of 4.5 g/t Au (ibid.). In 2004, 213 539 ounces were added to new discovery reserves. 205 268 ounces were added to net new reserves after engineering work (i.e., re-evaluation) was undertaken in other, "older" areas of these deposits (ibid.). Production targets for 2005 are 241 435 ounces of gold at a milling rate of 4000 tons per day (*Inside Musselwhite Mine*, v.8, issue 1, Winter 2005).

EXPLORATION ACTIVITY

Sixty-one exploration programs were undertaken in 2004 (*see* Table 3) in the Thunder Bay North District. Gold was the most sought-after commodity, followed by platinum group metals, base metals and diamonds. Mining Lands statistics for the Thunder Bay and Patricia mining divisions are shown below (http://www.mndm.gov.on.ca/mndm/mines/lands/).

Mining claims staked and cancelled in 2004.

Mining Division	Claim Units Staked	Claim Units Cancelled	Active Claim Units *(as of December 2004)*
Thunder Bay	14 098	9 303	43 141
Patricia	2 204	1 553	8 309

Assessment work by industry sector for work filed in 2004.

Mining Division	Independents	Junior Mining Companies	Major Mining Companies	Total
Thunder Bay	$ 1 523 039	$ 6 969 905	$ 655 368	$ 9 148 312
Patricia	$ 494 332	$ 1 590 454	$ 6 045 624	$ 8 130 410

ADVANCED EXPLORATION

Roxmark Mines Limited conducted an Advanced Exploration program on its Leitch–Sand River Mine property near Beardmore. Two vein systems were exposed by stripping. Trenching, channel sampling and stockpiling of vein material was conducted at the East Leitch and Sand River #16 zones, respectively. Visible gold occurs within fractures in quartz veins and most commonly is found along thin seams or septa of sericite and chlorite, along with arsenopyrite, pyrite and ankerite in composite, "crack-seal"-textured veins. The Leitch Mine operated from 1937 to 1965, milling 906 395 tons at a recovered grade of 0.92 ounce Au per ton, yielding 860 648 ounces of gold. The Sand River Mine operated from 1937 to 1942, milling 157 870 tons at a recovered grade of 0.32 ounce Au per ton, yielding 50 065 ounces of gold (http://www.roxmark.com/prop_beardmore.html#sandriver). Stripping of these areas had been recommended in preparation for taking bulk samples (ibid.). Geological mapping and sampling helped to gain a better understanding of the mode of occurrence, and to identify other possible veins and extensions in the #16 zone. Further exploration in the form of diamond drilling in 5 areas was recommended as follow-up work in preparation for underground exploration and development. Bulk samples will be extracted and processed at Roxmark's 200 ton-per-day Northern Empire Mill in Beardmore.

Roxmark reported the results of samples taken from the #16 zone (Roxmark Mines Limited, news release, December 16, 2004). Channel samples were cut every 3 feet. All samples were a minimum of 1 foot wide. The #16-1 West Vein returned an average assay of 1.737 ounces Au per ton over a strike length of 42 feet. The #16-1 East Vein returned 0.347 ounce Au per ton over a strike length of 37 feet. The recent assay results confirm the historical surface sampling data completed by Teck Corporation. Furthermore, the current assay results are consistent with the historical drill hole results of Teck Corporation in the 1980s on the #16-1 Vein. Recent assays by Roxmark of the #16-5 West vein were 1.058 ounces Au per ton over a 26.5 foot strike length. The #16-5 East Vein returned 1.094 ounces Au per ton over a strike length of 35.0 feet. The company is continuing with its plan for the surface bulk sample program and in particular, the in-fill sampling on the #16-1 and #16-5 veins.

Roxmark also acquired the Amorada Nortoba–Tyson gold-molybdenum property, 10 km north-northwest of Beardmore (ibid., August 19, 2004). Roxmark raised over $3.46 M through a private financing (ibid., January 24, 2005) to cover the cost of advancing the gold and molybdenum properties in the Beardmore–Geraldton area and for general working capital of the Company.

Gold

NORTH CARIBOU LAKE AREA

Placer Dome North America Ltd. carried out a number of exploration projects in the vicinity of the Musselwhite Mine (*see* "Mining Activity").

Romios Gold Resources Inc. suspended the proposed exploration on its Lundmark–Akow Lake Property, as set out in its press release dated November 14, 2003, pending discussions with the North Caribou Lake First Nation (news release, January 19, 2004). Joint-venture partners **Canadian Shield Resources Inc.** and **Millennium Minerals Limited** were also in discussions with North Caribou Lake FN regarding proposed plans for their Erichsen Lake property.

PICKLE LAKE AREA

MetalCORP Limited announced on August 10, 2004, the discovery of a new gold occurrence on their Connell Property near Pickle Lake (MetalCORP Limited, news release, October 13, 2004). The Jigger showing yielded a value from a grab sample of 95.63 g/t Au. Subsequent grab sampling yielded 19.58 to 83.73 g/t Au. The samples were described as quartz-carbonate veins within a strongly sheared (quartz-carbonate-sericite schist) zone containing trace to 2% pyrite. Visible gold had been noted. The shear zone is a minimum of 50 m wide and a minimum of 600 m in strike length, coincident with an airborne magnetic low anomaly. Using a backhoe, MetalCORP exposed more of the shear zone and undertook systematic channel sampling designed to reveal a more representative grade of this newly discovered gold zone. Visible gold has been noted in some of the channel samples; assay results are pending. The company plans to conduct diamond drilling on this new gold zone, including the Jigger showing, during the winter of early 2005. MetalCORP is currently presenting the Pickle Lake project results to several major gold mining companies with the intention of securing a suitable partner to assist in exploring the property further (ibid.).

King's Bay Gold Corporation and **Richview Resources Inc.** conducted an extensive drilling campaign on their Pickle Lake joint-venture project, contiguous to the past-producing Dona Lake, Central Patricia, and Pickle Crow mines. This large land package hosts numerous gold showings, significant historical drill intersections and mine workings. Significant assay results (King's Bay Gold Corporation, news release, January 19, 2005) include

Drill hole	Intersections (feet)	Width (feet)	Au (g/t)
PL04-04	70.0 to 75.0	5.0	4.021
PL04-05	345.0 to 350.0	5.0	5.778
PL04-06	105.0 to 110.0	5.0	1.684
	113.5 to 115.0	1.5	22.373
	115.0 to 120.0	5.0	4.023
PL04-11	379.0 to 393.0	15.0	1.582
PL04-18	247.0 to 249.0	2.0	9.385
PL04-19	324.0 to 330.0	7.0	1.485
PL04-22	140.0 to 147.5	7.5	3.571
	165.0 to 175.0	10.0	7.007
PL04-26	132.5 to 137.5	5.0	2.720
	285.0 to 305.0	20.0	7.311
PL04-27	177.5 to 185.0	7.5	3.058
PL04-29	393.5 to 403.5	10.0	11.059
	441.0 to 451.0	10.0	3.789
PL04-31	157.0 to 158.0	1.0	5.305
PL04-32	175.0 to 177.09	2.0	1.884
PL04-33	424.5 to 429.5	5.0	4.338
PL04-34	272.5 to 275.0	2.5	1.882
PL04-35	352.0 to 354.5	2.5	0.653

All zones are open at both ends and at depth. The joint-venture partners are encouraged with these ongoing new significant results and plan to conduct more drilling in the area of the Southwest Powderhouse Zone.

Queenston Mining Inc. optioned the Don's Lake gold property in the Meen–Dempster greenstone belt, approximately 100 km southwest of Pickle Lake (Queenston Mining Inc., news release, July 15, 2004). Queenston completed 5 diamond drill holes totalling 1840 m (ibid., December 13, 2004). The drilling targeted 2 shear zones where previous historic drilling and surface sampling intersected gold values including 17.6 g/t Au over 1.1 m. The 2004 drilling intersected numerous structurally controlled zones of alteration containing anomalous gold mineralization in both mafic volcanic and felsic intrusive rocks. The assay results proved disappointing, with a best intersection of 1.0 g/t Au over 0.7 m. The results did not meet management expectations and further exploration is not planned at this time. Queenston has fulfilled their option commitments.

McVicar Resources Inc. completed an airborne magnetic survey of its Kasagiminnis Lake property near Pickle Lake (McVicar Resources Inc., news release, September 14, 2004). The property which is held by McVicar and **Asia Now Resources Limited** was drilled in the 1980s by Moss Resources Ltd. and Power Explorations Inc. Almost 10 000 m of drilling identified an iron formation-hosted gold deposit (2.9 million t grading 5.8 g/t Au; *The Northern Miner*, April 18, 1988, p.13) with intersections grading up to 21.2 g/t gold over 4.24 m. The objective of the survey was to provide detail about the extent of the iron formation and identify structural discontinuities which might host gold. The program was successful in the identification of 6 new target areas for potential gold mineralization.

FORT HOPE AREA

Landore Resources Inc. carried out drilling on its Miminiska Lake property. Drill holes totalling 836 m tested the down-dip and plunge extension of gold mineralization intersected in earlier 2003–2004 drilling (Landore Resources Inc., news release, April 6, 2004). Significant gold mineralization was returned from two of the holes including 132.1 g/t Au over 0.5 m in hole 0604-32 and 9.8 g/t Au over 3.5 m in hole 0604-33. These intersections support the model of a steep westerly plunge to the gold zones. Gold mineralization has now been intersected at a vertical depth of 210 m in hole 0604-32 and remains open at depth. Gold mineralization is associated with pyrrhotite-arsenopyrite mineralization within zones of quartz veining or flooding in altered and deformed, oxide-facies iron formation. Visible gold was noted in both high-grade intersections in holes 0604-32 and 0604-33. Structural studies have provided useful insights into structural elements of mineralization and, in particular, the relationship between quartz-carbonate veins and gold-bearing pyrrhotite-chlorite intervals. Steps to define linear structural controls have been recommended and will be instigated to guide future drill programs. Landore resumed their drilling program in November and will likely continue until February 2005 (J. Garber, Landore Resources Inc., personal communication, 2005).

SLAM Exploration Ltd. completed a diamond drilling program at the Miminiska–Keezhik project (Slam Exploration Ltd., news release, August 24, 2004). Twelve diamond drill holes were completed for a total of 2204 m. Two holes intersected significant gold-bearing intervals associated with shear zones in an altered quartz-feldspar porphyry stock at Keezhik Lake. SLAM will conduct further work to evaluate the potential of these newly discovered gold occurrences. Holes S04-08 and S04-09 tested separate humus geochemical and induced polarization (IP) anomalies located 600 m apart within the quartz-feldspar porphyry stock. The highest-grade interval occurs in hole S04-08 where 13.714 g/t gold over 0.5 m is associated with a chloritic shear zone in quartz-feldspar porphyry. Hole S04-09 contains a 3 m interval with a weighted average of 2.721 g/t Au that includes a 1 m sample that returned 4.428 g/t Au. SLAM has an option with **1533687 Ontario Ltd.**, to earn a 70% interest in the Miminiska–Keezhik property. SLAM also has interests in other nearby gold properties: Cadman Lake (SLAM 100%); Opikeigen Lake (50% SLAM–50% Pure Gold Minerals Inc.) and Reserve Creek (SLAM 100%; Eastmain Resources Inc. to earn 50%).

Eastmain Resources Inc. conducted preliminary geological and geophysical surveys over the Reserve Creek A and B gold zones and their lateral extensions (Eastmain Resources Inc., news release, November 22, 2004). Previous drilling on the prospect intersected gold-bearing, pyritic and carbonate-altered mafic volcanic rocks 3 to 20 m thick to a depth of 100 m. Induced polarization (IP) surveys carried out in 2004 confirmed a pronounced IP anomaly coinciding with the gold-bearing zones and their lateral extensions. Several untested IP anomalies have been detected both within the mineralized mafic volcanic rock formation and within overburden-covered terrain. A diamond drill program was planned for early 2005 to test the A and B Zones and regional IP anomalies.

Candor Ventures Corp. completed ground magnetic and IP surveys and identified drill targets associated with a folded iron formation on its Miminiska Lake property (Candor Ventures Corp., news release, July 9, 2004). Limited drilling on the Miminiska Peninsula by a previous operator intersected visible gold along the south limb of the

folded iron formation resulting in grades of up to 33.5 g/t Au. Work by Candor in late 2003, using the Mobile Metal Ion® process (MMI), identified strong gold, silver and arsenic anomalies in soil corresponding to the down-plunge projection of the fold closure. A number of chargeability anomalies have been identified in both the area of the iron formation fold closure and along the fold limbs. A drill fence across the most prospective geophysical anomalies on the nose of the anticline fold is planned for the property. Holes will be sited to intersect the maximum number of IP anomalies. Drilling was planned, pending rig availability (ibid., November 29, 2004). A merger between Candor Ventures Corp. and **Nustar Resources Inc.** was announced (ibid., September 23, 2004). The combined company will assume the name **Canstar Resources Inc.**

MetalCORP Limited acquired the Keezhik Lake property by staking (MetalCORP Limited, news release, August 31, 2004). A number of gold occurrences were discovered at Keezhik Lake by Noramco Exploration in the 1980s, but no further work has been carried out since then. The company plans to carry out further drilling on each of the zones to define the full extent of the gold mineralization.

ONAMAN–TASHOTA AREA

Kodiak Exploration Limited announced preliminary results from its multi-phase exploration program on its Knucklethumb project (Kodiak Exploration Limited, http://www.kodiakexp.com, news release, October 4, 2004). The $1.8M 2004 drilling and surface exploration program consisted of IP and magnetometer surveys, trenching, power stripping of outcrops, rock chip and channel sampling, geological mapping and soil sampling. An extensive ground magnetic survey followed by prospecting, mapping and stripping led to the new discovery area east of Metcalfe Lake, referred to as the Vent. Assay values included 2.68 g/t Au over a channel length of 0.62 m; 1.01 g/t Au over a channel length of 1.66 m; and 107 g/t Ag and 0.59% Cu over a channel length of 0.44 m. A program of in-fill IP surveying will be done to further define the orientation of the chargeability zones and the extent of some of the IP anomalies that remain open. Diamond drilling the high priority, geological, geophysical and geochemical targets is planned for 2005 (ibid., October 28, 2004).

High-grade gold was discovered at what is now known as the Kodiak Showing in June 2004, when a grab sample returned 306.58 g/t Au (ibid., October 4, 2004). Native gold occurs in a 9.0 cm thick quartz vein adjacent to a 1.5 m wide quartz-carbonate stockwork zone in a gabbro. One shallow exploratory drill hole (KL04-20) intersected visible gold in a 7.0 cm wide quartz vein within a 7.0 m wide alteration zone of strongly brecciated, fuchsitic, carbonatized and silicified porphyritic gabbro.

Preliminary work on the Knucklethumb property in 2004 led to the following gold discoveries: Thor–Colby–Quinten; MVP; MB–DH; Aidan copper-gold; and Josef polymetallic. Previously known occurrences (Ryne; Hourglass; Hourglass West; Cabin–JR Shear; Big Bear Shear; Wobbegong copper-zinc; Kipper–Cameron) were also explored (http://www.kodiakexp.com/projects/knucklethumb.asp).

Superior Canadian Resources Inc. explored its Aurum Property in the O'Sullivan Lake area (Superior Canadian Resources Inc., news release, June 22, 2004). A comprehensive review of previous geophysical, geochemical, mapping and sampling results was undertaken. Aeroquest flew a helicopter-borne magnetic and time-domain electromagnetic (TDEM) survey in early June to upgrade and improve understanding of the previously reported gold and copper surface exploration and drilling results completed in the mid- to late-1980s. Superior Canadian completed 17 km of line cutting, geological mapping, prospecting and sampling on the property.

Spruce Ridge Resources Ltd. continued work on their Spruce Hull Lake property in Oboshkegan Township and announced that a program of exploratory stripping carried out in the fall of 2004 located a new zone of gold mineralization, 1200 m southeast of the area of widespread gold mineralization opened up in 2003 (Spruce Ridge Resources Ltd., news release, January 25, 2005). The Black Dog Zone was exposed in a newly stripped area 160 m long and up to 55 m wide. Altered and sheared metavolcanic rocks are intruded by quartz porphyry dikes and contain widespread disseminated pyrite and an extensive quartz stringer system. One cluster of quartz stringers contains coarse visible gold. Channel sampling on the Black Dog Zone indicated widespread low-grade gold over an area of 130 m by 35 m, with localized higher values. One series of channel samples returned an average of 3.03 g/t Au across 4.50 m, including a 0.30 m section returning 30.87 g/t Au, where visible gold was observed. The zone is open along strike to the west and northwest. The claim on which the Black Dog zone was found is surrounded on 3 sides by property held under option by Kodiak Exploration Ltd.

Further channel sampling was also carried out on the Spruce Hull Lake north claim group, where stripping and channel sampling in 2003 indicated hydrothermal alteration (chloritization, silicification) and gold mineralization over an area of 200 m by 125 m. Six continuous channel samples were cut and sampled for assay in areas that had not been sampled previously: 3 in the "Moose Zone" and 3 in the "Central Zone". The 3 Moose Zone samples gave the following average assays: 0.86 g/t Au over 2.40 m; 0.54 g/t Au over 3.00 m; 1.17 g/t Au over 1.20 m. The 3 channels in the Central Zone all returned very low assays for gold. The Moose Zone results significantly increased the known extent of low-grade gold mineralization in the stripped area. The company plans a 1000 m diamond drilling program in early 2005 to test both sets of targets (ibid.).

Landore Resources Inc. contracted an Aeroquest TDEM survey over its Junior–Lamaune Lakes property, east of Armstrong, in May (J. Garber, Landore Resources Inc., personal communication, 2005). This survey was followed by additional staking, IP surveys, prospecting and trenching. The property's gold potential was boosted by Landore's discovery of the BAM gold occurrence in 2003. Further work is planned for 2005.

BEARDMORE–GERALDTON AREA

Roxmark Mines Limited conducted an Advanced Exploration program on its Leitch–Sand River Mine property near Beardmore (*see* "Advanced Exploration").

Alto Ventures Ltd. acquired and carried out initial exploration on the Cote–Archie Lake gold property near Beardmore (Alto Ventures Ltd., news release, November 17, 2004). The property covers 12 km of prospective ground 5 km east of, and along strike from, the past-producing Leitch Mine. Initial exploration on the property, involving prospecting, trenching, and preliminary sampling, has resulted in the identification of 2 gold occurrences, including an east-northeast-trending shear zone, up to 12 m wide, believed to represent the strike projection of the structure hosting the Leitch veins. The zone has been exposed in 2 trenches, 200 m apart, with quartz and quartz-carbonate-sulphide veins from which grab samples contain up to 10.2 g/t Au. The original Cote gold showing, located 600 m to the north, has reported gold mineralization of up to 0.79 ounce Au per ton (Resident Geologist's files, Thunder Bay North District, Thunder Bay). Further trenching by Alto in this vicinity traced a series of shear-hosted quartz veins in a north-northwest-trending direction. Initial grab samples from veins in these trenches returned up to 17.3 g/t Au. More detailed prospecting, trenching, and systematic channel sampling for definition of drill targets will be carried out in both areas during the 2005 summer program. Alto also acquired in 2004 the Mud Lake and Greenoaks gold properties, 25 km northeast and 20 km north-northeast of Beardmore, respectively (Alto Ventures Ltd., news releases, November 4, 2004, and December 30, 2004).

Buck Lake Ventures Ltd. announced the discovery of 2 gold occurrences on the Gwyn Lake property east of Beardmore (Buck Lake Ventures Ltd., news release, September 7, 2004). The property was optioned from Beardmore prospector, Frank Houghton in 2004. Initial exploration targeted 2 of 3 well-defined, east-northeast-trending, subparallel zones delineated by airborne magnetic and electromagnetic (EM) anomalies, representing a regional banded iron formation. Work on the property included prospecting, reconnaissance sampling, and mapping, as well as hand trenching and channel and/or chip sampling. The summer work program successfully confirmed the presence of highly anomalous gold values within 2 of the 3 zones on the property. Gold-mineralized iron formation returned up to 4.56 g/t Au over 2.5 m on the North Zone and 5.33 g/t Au over 2.0 m on the South Zone. Buck Lake plans a more detailed surface program to better define the North and South zones along strike, and to identify the gold potential of the Central Zone.

Novawest Resources Inc. completed a diamond drill program on the Solarus project, east of Longlac (Novawest Resources Inc., news release, December 1, 2004). Drill holes KL-04-08 and KL-04-09 were drilled approximately 100 m east of the interpreted termination of the Main Zone. The best gold values from these holes were obtained from sheared mafic rocks containing minor to 1% disseminated pyrite, proximal to the contact with the diorite to the south. Significant gold assays were also obtained from diorite in this area. Hole KL-04-08 returned an assay of 3.107 g/t Au over 0.6 m from sheared mafic volcanic rocks containing 1% disseminated pyrite and 1.262 g/t Au over 1.0 m from diorite containing 5 to 8% disseminated pyrite. Hole KL-04-09, drilled beneath Hole RL-04-08, intersected 1.883 g/t Au over 2.1 m from a moderately sheared mafic volcanic rock containing 1% disseminated pyrite. This zone was intersected at a vertical depth of 10 m in Hole KL-04-08 and at a vertical depth of 65 m in Hole KL-04-09. Additional sampling succeeded in expanding the width of the zone to 5.90 m grading 2.514 g/t Au. Completion of the compilation of all exploration data and additional diamond drilling to fully evaluate the gold-bearing structures has been recommended by Novawest.

Teck Cominco Limited carried out some prospecting, trenching and sampling on its Adel gold property, east of Longlac (J. Paakki, Teck Cominco Limited, personal communication, January, 2005). A 40 m wide altered and mineralized zone was uncovered near some pre-existing trenches. Grab samples returned up to 18 g/t Au from silicified, sulphidized (pyrite, arsenopyrite) banded iron formation and quartz porphyry (ibid.).

The local prospecting community was very active in the Beardmore–Geraldton area. Prospectors such as L. Clarke, R. Cote, N. Cox, H. Goodman, Jr., H. Greenland, L. Holt, F. Houghton, D. Kindlaw, A. Lafontaine, C. Lance, M. Nelson, C. Pettit, E. Rutherford, J. Savage and E. Thorsteinson worked on their respective gold properties in 2004.

Platinum Group Elements (PGE)

Richview Resources Inc. funded diamond drilling on joint-venture partner, **PGM Ventures Corporation**'s Thierry Mine copper-nickel-PGE property near Pickle Lake (N. Novak, Billiken Management Services Inc., personal communication, 2005). The focus of the program, started in October, was to further define the extent of mineralization and the structural characteristics of the Thierry deposit. This work will fill in gaps in the data generated by Umex Inc. in the 1970s and 1980s, and by PGM Ventures in 2002. Fifteen (15) of the 22 planned holes have been completed to date (February 14, 2005). The results will be used to update a resource calculation of the deposit. An ore reserve generated by Umex at mine closure was 15.5 million tonnes grading 1.98% Cu (Canadian and American Mines Handbook, 2004–2005, p.338). Drilling was also carried out on several anomalies discovered by geophysical surveys conducted in late 2004 on the West Wildcat grid (5 km northeast of the Thierry Mine) and on the South Shore grid (south of the Thierry Mine, on the south side of Kapkichi Lake). Disseminated to massive pyrite, pyrrhotite and minor chalcopyrite were noted in these holes, coincident with the anomalies (N. Novak, ibid.).

East West Resource Corporation, **Canadian Golden Dragon Resources Ltd.** and **Cascadia International Resources Inc.** announced an 1100 m diamond drill program had started at the Norton Lake Ni-Cu-Co-PGE deposit, northeast of Fort Hope, with the objective of following the plunge of the existing deposit beyond a depth of 200 to 250 m (East West Resource Corporation, news release, April 5, 2004). A 944 500 tonne resource to the 100 m level had previously been calculated in 1981. Airborne TDEM surveys, flown in 2003 and 2004, have located several other conductors along a trend of favourable pyroxenite host rocks that will be followed up by drilling in a later phase of exploration. East West subsequently announced that an intersection of the zone at a depth of 250 m doubled the depth extension (East West Resource Corporation, news release, April 28, 2004). Due to the success of the six-hole program, an additional three-hole section was attempted before spring break-up demobilization. Eight of the drill holes intersected the massive sulphide main zone and the last hole (9) was stopped short of the main zone due to a scheduled move of the drill equipment. However, a new, parallel, pyroxenite zone containing pyrrhotite and chalcopyrite was discovered near the top of the last hole and will be followed up in a future drill program. Holes NL04-01 and 02 were drilled to locate the down-dip extension of an earlier 2002 hole; they were successful in showing that the zone not only continues to depth, but has consistent width and grade. This accomplished the main objective of this winter program and gives confidence that deeper holes to the 300 and 400 m depth can be attempted possibly expanding the original resource figure. A future drill program of in-fill drilling will be required to close the drill intercepts to 25 m centres to comply with new standards as defined by National Instrument 43-101. A future drill program is being designed to drill the deeper elevations and also test 2 other anomalies on strike that are within 200 and 400 m of the main zone, respectively (ibid.). A down-hole EM survey and a pulse EM survey were initiated in February, 2005, to better test the massive sulphide target (ibid., February 3, 2005).

East West Resource Corporation and **Cascadia International Resources Inc.** completed 5 drill holes on their Linsey Bay project, southwest of Fort Hope (East West Resource Corporation, news release, April 5, 2004). Three holes in the program encountered copper-nickel mineralization in a gabbro-pyroxenite-peridotite intrusion. A TDEM survey had identified 4 other conductors that occur within this intrusion, including one that adds 100 m to the strike extent of the mineralization discovered by the 3 holes. The 5 holes that were completed in April, testing 3 EM target areas, resulted in the discovery of an ultramafic-pyroxenite body carrying widespread copper-nickel-cobalt mineralization as well as a new area that has potential for VMS mineralization (East West Resource Corporation, news release, April 23, 2004). Holes 2, 3, and 4, drilled to test a moderate EM conductor near an old copper-nickel-bearing showing, returned assays up to 1.39% Cu, 0.54% Ni, and 1.0 pound Co, with higher concentrations over 3 m near the lower contact of the intrusion. Other copper-cobalt-bearing showings have been identified in the past on the west side of the property in anorthosite. Hole 1 hit a massive sulphide layer 1 to 3 m thick, but did not carry significant base metal values.

Superior Canadian Resources Inc. completed a follow-up helicopter-borne magnetic and TDEM surveys over the previously identified TDEM anomalies on the Sim Lake property south of Fort Hope (Superior Canadian Resources Inc., news release, June 22, 2004). Some prospecting and sampling was also undertaken.

Landore Resources Inc. contracted an Aeroquest TDEM survey over its Junior–Lamaune Lakes property, east of Armstrong, in May (J. Garber, Landore Resources Inc., personal communication, 2005). This survey was followed by additional staking, IP surveys, prospecting and trenching. The property hosts the B4-7 zone, which has a previously reported resource of 2.1 million tons grading 0.87% Ni and 0.59% Cu (Landore Resources Inc., http://www.landore.com/canada%20Junior%20Lake.htm). Further work is planned for 2005.

Bell Resources Corporation conducted a diamond drill program on the Falcon Project, south of Pickle Lake, in April 2004 (http://www.bellresources.com). The program consisted of 800 m in 3 holes, designed to test a single target in gabbroic rock previously drilled by Falconbridge Nickel Mines Limited. The program tested the target at depths of 100 to125 m below surface, deeper than the Falconbridge pierce points, and analyzed the core for copper, nickel, platinum, palladium, gold and cobalt. The drill core provided no economic values for the targeted base metals and, based on the results of this drill program, the company anticipated that the next work program will include down-hole surveys on 2 of the 3 holes; follow-up of lake sediment coincident gold and silver anomalies previously discovered on the property; and a prospecting program to investigate area of electromagnetic and magnetic anomalies to the north and east of recent drilling.

Spider Resources Inc.–KWG Resources Inc.'s Kitchie Lake property was identified during the 1996 and 1997 field seasons when Spider and KWG completed a regional airborne geophysical program, as well as a regional geochemical program, covering the Spider #3 project area. During 2003, staking of 32 claims was completed to cover a favourable geological formation that is highly prospective for base metals and PGE (http://www.kwg-resources.com/explore). During the summer of 2003, an airborne electromagnetic and magnetic survey, totalling 495 line-kilometres, was completed and a number of anomalies were identified. The joint-venture partners recently expanded their staking. The Kitchie Lake property is situated on the western portion of the Fishtrap Lake intrusive complex. **Aurora Platinum Corp.** and **Northern Shield Resources Inc.** also have properties on the central (Fishtrap Lake property) and eastern (Highbank Lake property) parts of the complex, respectively, within the Timmins Regional Resident Geologist District.

Brigadier Gold Limited announced that it has entered into an option agreement with **Platinex Inc.** to earn a 50% interest in the Big Trout Lake PGE-gold and nickel-copper property (Brigadier Gold Limited, news release, December 1, 2004). The Big Trout Lake complex is a large, layered intrusion with an unfolded strike length of up to 93 km and a thickness of up to 7 km. Previous drilling on the property in the 1970s and 1980s by Inco, Canadian Occidental Petroleum, Degussa AG and International Platinum Corporation intersected significant PGE mineralization in several holes grading up to 15.1 g/t Pd+Pt+Au over 1.0 m in association with laterally extensive chromium-bearing layers. A recent synthesis of all exploration and research on the property greatly improved the focus of future exploration efforts and confidence in the continuity of the chromium-PGE mineralization. A $1.5M, two-phase exploration program was planned to test 6 targets which have already been shown to be prospective for PGE, gold, nickel, and copper. The initial target is a previously untested, 800 m long horizontal loop EM (HLEM) anomaly interpreted to be a 2 m thick, steeply dipping, massive sulphide body at the base of the intrusion. Target 2 is an untested, but inferred, PGE-chromium-bearing layer with a potential strike length of 8.6 km. In the expanded phase 2 program, 6 holes are intended to test this area along a 4.2 km segment of its strike.

MacDonald Mines Exploration Ltd. reported on 9 holes drilled in November and December, 2004, on the Big Mac and MacNugget properties east of Webequie, completing Phase III of the 18 hole, 2004 reconnaissance anomaly drilling program (MacDonald Mines Exploration Ltd., news release, January 24, 2005). Hole MN-5 was drilled 2 km to the south of an outcrop of sulphide-rich gabbro and intersected a well-differentiated gabbro with several horizons of trace sulphides and significant titaniferous magnetite. Base and precious metal assay values are still outstanding and will be reported when the results become available. The interval 44.0 to 47.6 m consisted of massive magnetite averaging 0.34% Ti and 0.24% V.

Diamonds

Superior Diamonds Inc. continued their kimberlite exploration in northwestern Ontario (http://www.superiordiamonds.ca/s/AEMDiamond.asp). Superior initially defined 3 regions of interest for kimberlite exploration: 1) Stull Lake (18 000 km^2); 2) Lansdowne (5100 km^2); and 3) Muskrat Dam (12 200 km^2); the latter 2 regions fall within the Thunder Bay North District. **Aurora Platinum Corp.** acquired proprietary magnetic data from Inco Limited in 2001 for each of these 3 regions, and Superior has access to these data persuant to its agreement with Aurora. During the summer of 2002, each target was assessed for its kimberlite potential through the collection and processing of overburden samples for kimberlite indicator minerals (KIMs). In addition, regional overburden surveys were completed to identify additional kimberlite targets. From this program, priority kimberlite targets were defined in each region: 1) 11 for Lansdowne; 2) 5 for Stull Lake; and 3) 4 for Muskrat Dam. These results prompted a fixed-wing, geophysical magnetic survey in the fall of 2002 with 150 m-spaced flight lines. In spring 2003, Superior focussed on 5 areas within the Lansdowne region for detailed overburden sampling surveys. In summer 2004, Superior undertook several overburden sampling programs. The first designed to address the problem of identifying and prioritizing possible kimberlite targets buried under glaciolacustrine silts and clays. In an attempt to verify and prioritize possible kimberlite targets for drilling, overburden samples were collected over 12 potential kimberlites for MMI analysis from one of the 5 areas sampled in the Lansdowne region in 2003. Three other programs involved a combination of regional- and local-scale overburden sampling around target areas established from the 2002 overburden sampling program. Superior is evaluating data from all programs. If application of the MMI data is successful, this program will be expanded next year and used to evaluate all possible kimberlite targets in the Lansdowne region. The data from the other 3 overburden sampling programs will provide the focus for airborne magnetic surveys to be flown in 2005 (ibid.).

The Winisk Project is the third project inherited by **Superior Diamonds Inc**. from **Canabrava Diamond Corp.** Superior has a joint venture agreement with **Inco Limited** to explore an area covered by Inco's airborne electromagnetic, magnetic and ground follow-up data (http://www.superiordiamonds.ca/s/Winisk.asp) along the northern edge of the Thunder Bay North District. During the summer of 2004, a limited overburden sampling program was completed to assess the potential of the area for kimberlite. These samples have been submitted for processing and Superior is awaiting results. Under the terms of the agreement, Superior will digitize the Inco data and incur expenditures of $1 million (by April 2007) on anomaly selection and follow-up and/or the acquisition and exploration of mineral properties within the area of interest. If Superior acquires any mineral properties within the area of interest during the evaluation period, Inco has certain "back-in rights" (ibid.).

De Beers Canada is focussing exploration on the Superior Craton in Ontario. De Beers has projects ranging from grassroots exploration in targeted areas, detailed follow-up and initial kimberlite delineation drilling program, to evaluation and bulk sampling (http://www.debeerscanada.com/). Preliminary exploration by De Beers in the Kasabonika area has sparked partnerships with the local First Nation community (*Northern Ontario Business*, July, 2003). An estimated 40 sites had been staked.

MacDonald Mines Exploration Ltd. reported on base and precious metal drilling in November and December, 2004, on the Big Mac and MacNugget polymetallic properties in the James Bay Lowlands east of Webequie (MacDonald Mines Exploration Ltd., news release, January 24, 2005). During the course of interpreting the geophysical survey for the MacNugget claim blocks, 20 short-length, poor conductors were indicated to be possible kimberlite targets. In the MacNugget and Big Mac areas, there remain at least 20 such geophysical targets that may be drill-tested.

Volcanogenic Massive Sulphide (VMS)

MacDonald Mines Exploration Ltd. undertook a ten-hole diamond-drill program on its MacNugget property, southwest of McFaulds Lake in the Sachigo Subprovince (MacDonald Mines Exploration Ltd., news release, December 1, 2004). The property is located at the southwestern end of an arcuate sliver of the Kasabonika–McFaulds greenstone belt (Stott and Rayner 2004), south and west of the original copper- and zinc-rich, massive sulphide discoveries on the Spider Resources Inc.–KWG Resources Inc. claim group (http://www.spiderresources.com/). MacDonald Mines reported on 9 holes drilled in November and December on the Big Mac and MacNugget properties, completing Phase III of the 18 hole, 2004 reconnaissance anomaly drilling

program (MacDonald Mines Exploration Ltd., news release, January 24, 2005). During the MacNugget campaign, 6 VTEM anomalies were drilled, 4 of which intersected massive sulphides consisting of pyrite, pyrrhotite, chalcopyrite and sphalerite. Hole MN-3, for example, returned 1.5 m averaging 2.1% Cu and 1.3% Zn, as well as 7.1 m averaging 0.79% Cu (ibid.).

Kodiak Exploration Limited explored the Wobbegong and Josef zones as part of their large, Knucklethumb Lake gold property in the Onaman–Tashota greenstone belt, west of Nakina (http://www.kodiakexp.com/). The Wobbegong copper-zinc-bearing VMS target lies within a number of VLF–EM conductors with a 7.0 km total strike length. In its 2004 work program, Kodiak completed 45 line-kilometres of Max-Min II horizontal loop electromagnetic (HLEM) and ground magnetometer surveys on this prospect. A series of strong EM conductors were outlined over a strike length of more than 4 km of which, several parts are exposed by mechanical trenching and reveal disseminated to massive sulphide mineralization. Analytical results indicated a correlation of copper and zinc anomalies with EM conductors, as well as other anomalies, unrelated to the conductors. The stratigraphy at Wobbegong is typical of a volcanic centre; the alteration and distribution of sulphides suggest focussed discharge. Recent prospecting at the Josef Zone returned values of up to 2.11 g/t Au in grab samples. This zone is part of a sulphide-bearing stratigraphic unit that is traced on surface for approximately 65 m before passing under Barn Lake. It is between 15 and 20 m in width on surface and dips southeastward between 45 and 90°. Mineralization consists of 20 to 25% pyrite within a cherty exhalite, interbedded clastic metasedimentary rocks and massive to pillowed mafic flows. A northeast-trending airborne electromagnetic conductor that extends under Barn Lake for approximately 1.0 km is thought to represent the on-strike extension of the Josef Zone. Further geophysics and drilling has been recommended (ibid.).

East West Resource Corporation's entered into a joint venture with **Noranda Inc.**, in October 2003, over the Havoc property to focus primarily on VMS targets (http://www.eastwestres.com/). Three drill holes were completed in December 2003 following an extensive soil geochemical survey over EM conductors north of Vooges Lake. Anomalous copper and zinc values coincided with portions of the EM conductors and 2 of these were tested by drilling. Felsic volcanic rocks and graphitic sedimentary rocks were found in holes HAV03-6 and 7 with considerable pyrite. In February 2004, a detailed, helicopter-borne EM and magnetic survey was completed over a specific area north and east of Vooges Lake. It traced the full extent of the known EM conductors and identified 2 new, parallel, discrete conductors. Soil sampling over these new targets was completed in July 2004. Phase Two diamond drilling had been planned for late 2004. Felsic volcanic rocks hosting zinc mineralization were intersected in an earlier drill hole, HAV02-4, north of Vooges Lake. Sodium depletion in the Havoc felsic rocks also suggests a highly favourable environment for VMS deposits (ibid.).

East West Resource Corporation and **Cascadia International Resources Inc**. noted VMS-style base metal mineralization in drilling completed on the Linsey Bay copper-nickel-cobalt project, southwest of Fort Hope (East West Resource Corporation, news release, April 5, 2004). Copper mineralization was noted in altered felsic metavolcanic rocks to the side of a pyroxenite. One sample in the felsic metavolcanic rocks returned 0.42% Pb, 0.9% Zn, 0.79% Cu, and 21.9 g/t Ag over 0.5 m. Hole 5 intersected an extensive garnet-magnetite-sulphide-anthophyllite-altered zone with anomalously high manganese values. Electromagnetic conductors adjacent to this alteration zone will be tested as massive sulphide targets.

Tribute Minerals Inc. re-staked their VMS property near Melchett Lake, north of Nakina in 2003 (http://www.tributeminerals.com/). Although no exploration work was reported in 2004, prospecting, geological mapping, sampling, ground geophysics and diamond drilling had been recommended. Base metal mineralization consisting of pyrite, sphalerite, chalcopyrite and galena occurs within felsic metavolcanic sequences. The favourably mineralized stratigraphy has been delineated over a strike length of 20 km. Massive sulphides to fine-grained, disseminated sulphides or discrete lenses have been recognized. Three copper-zinc-lead±silver±gold-mineralized zones have been discovered on the property in previous exploration programs: Relf, Nakina #1 and Nakina #2 zones (ibid.).

Iron Oxide–Copper–Gold

East West Resource Corporation and the **Ethelburga Group** announced that 2 substantial project areas adjacent to the Red Granite property near Armstrong were acquired (East West Resource Corporation, news release, December 9, 2004). Within the new area, the companies are investigating uranium, copper and PGE targets. The companies took the opportunity to expand their land package following a review of recently released airborne magnetic and gravity data. The newly expanded property was renamed the Armstrong Project. The companies subsequently reported that drill holes RG04-02, -03 and -06 penetrated flat-lying Proterozoic basalts, and intersected a series of red alkalic, porphyritic rocks and pegmatites that are highly anomalous in uranium, thorium, rare earth elements and zirconium, similar to the radioactive debris on the western side of the property (ibid., December 13, 2004). Further drilling to outline an extension of the porphyry along a major structural lineament will be done in order to test the highest uranium and thorium values obtained by an earlier airborne gamma-ray spectrometer survey flown by East West.

Maple Minerals Corp. and **East West Resource Corporation** started geological mapping and other grid-based exploration work on their Lang Lake copper-gold property 60 km west of Pickle Lake (East West Resource Corporation, news release, September 10, 2004). A resource of 23 million tonnes grading 0.35% Cu had previously been reported by Hanna Mining in 1969. Since a weak EM conductor is associated with the zone, 5 other untested conductors with associated IP responses within 1000 m of the original zone are considered to be important drill targets.

Linear Gold Corp. updated exploration results on their Kilometre 61 copper-molybdenum-silver-gold property, located approximately 60 km northeast of Armstrong, currently under option to **Noranda Inc.** (Linear Gold Corp., news release, December 24, 2004). Noranda carried out a five-hole diamond drill program, totalling 1178 m, in August, 2004, which tested the western end of an open, 500 m by 1000 m IP chargeability anomaly over a 100 m strike length, where there was good geological control from earlier trenching. The IP anomaly is associated with porphyry-style alteration, and Cu-Mo-Au-Ag mineralization, which was discovered in 2002, and exposed in trenching in 2002 and 2003. Although anomalous copper and molybdenum values were located in holes K-04-1 to K-04-3, the highest assay values were located in K-04-04, which returned 131 m grading 0.08% Cu and 0.047% Mo. In hole K-04-05, the northern porphyry body averaged 0.07% Cu over 87 m; a porphyry breccia zone at depth returned 0.19% Cu, 0.04% Mo, and 4.5 g/t Ag over 12.5 m. Both holes were 100 m step-outs to the east; these results indicate a potential for a possible Cu-Au-rich zone in the core of the system along strike to the northeast. Noranda is forecasting a budget of $300 000 for 2005, with a 2000 m drill program planned for February or March to test the easterly strike extension of the porphyry system. Line cutting, geological mapping, soil sampling and geophysics (IP) will also be carried out along strike to the east and west as ground conditions permit.

Uranium

Rampart Ventures Ltd. announced that it staked a block of 2111 claim units in the Nipigon Basin containing Sibley Group sediments, west of Nipigon (Rampart Ventures Ltd., news release, December 9, 2004). The newly acquired claims are known as the Black Sturgeon property, and cover an area regarded as having high potential for unconformity-type uranium mineralization. The Black Sturgeon property lies in the same area as 7 separate claim blocks previously acquired by Rampart, and brings the company's total land holdings in the Nipigon Basin to over 121 000 acres. The Black Sturgeon property covers a part of the Nipigon Basin where it is underlain by metavolcanic and metasedimentary rocks belonging to the southwesterly extension of the Beardmore–Geraldton greenstone belt. The company believes that this basement geology makes the property highly prospective for uranium. A deep-penetration, airborne TDEM survey of the Black Sturgeon property was planned for late 2004. The Black Sturgeon property lies within an area of mutual interest defined in the agreement between Rampart and **New Shoshoni Ventures Ltd.**, under which Rampart acquired the option to earn a 70% interest in 2 uranium properties in the Nipigon Basin (ibid., September 30, 2004).

Table 2. Assessment files received in the Thunder Bay North District in 2004.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Akow Lake	Romios Gold Resources Inc.	1998	GEM, GL, GM, Grav, IP RES, Samp	2.20395	53B15/SE-002, 53B16/SW-023
Ashmore Township	Malouf, S.	2004	Str	2.27869	42E10/NW-075
Beardy Creek	Platinex Inc.	1999-2004	Other	2.27123	53H12/SW-001, 53H12/NW-001
Chief Bay	Canplats Resources Corporation and Canadian Golden Dragon Resources Ltd.	2004	Grav	2.27169	52H11/SE-007, 52H10/SW-007
Connell Township	English, P.	2004	DD	2.27612	52O08/NE-002
Connell Township	King's Bay Gold Corporation	2003	GEM, GM, Lc	2.27177	52O08/NE-001
Crescent Lake	Linear Resources Inc.	2003	GC, GL, Pr, Str, DD, Lc, Samp	2.26906	52I08/NW-018
Dobie Lake	Commander Resources Ltd.	2004	AEM, AM	2.28126	52O06/NE-001
Duffell Lake	Lamoureux, B.	2000	GEM	2.20428	52O02/NW-004
Elmhirst Township	Lafontaine, S. and Nichols, G.	2001	Pr, Str	2.27223	42E13/SE-132
Ficht Lake	East West Resource Corporation	2003	AEM, AM	2.26263	52P02/NW-006, 52P02/NE-005
Fry Lake	Brown, D.	2003	GC	2.27103	52O03/NW-002
Fry Lake	Troon Ventures Ltd.	2002-2003	GC	2.26164	52O03/NW-001
Graydon Lake	Teck Cominco Ltd.	2002	GEM, GL, GM, Samp	2.26879	52H07/SE-002, 52H07/NE-002
Havoc Lake	East West Resource Corporation	2003	DD, Samp	2.27154	52H14/NE-013
Havoc Lake	East West Resource Corporation	2003	GC	2.26365	52H14/NE-006
Havoc Lake	East West Resource Corporation	2003	GC, GEM, Lc	2.27027	52H14/NE-012
Junior and Falcon lakes	Pichette, A. and Blanchard, R.	2003	GC, Samp	227758	42L05/NW-029, 52I08/NE-017, 42L05/SW-029
Junior, Falcon and Toronto lakes	Landore Resources Ltd. and Brancote Canada Limited	2003	GL, Tr, Samp	2.28008	42L05/NW-030, 42L05/SW-030, 52I08/NE-018

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Kawashe Lake	MacGibbon, T. and Fort Knox Gold Resources Inc.	1998	GC, GM	2.20490	52O06/SE-001, 52O03/NE-001
McVicar Lake	Gagne, P., Continuum Resources Ltd. and Prospector Consolidated Resources Inc.	2003	DD, Samp	2.27138	52O11/SW-004
McVicar Lake	Gagne, P., Continuum Resources Ltd. and Prospector Consolidated Resources Inc.	2003	GL, Str, Samp	2.27178	52O11/SW-003, 52O12/SE-002
Metcalfe Lake	Pelky, R.	2003	Tr	2.27392	42L04/NE-114
Michikenopik Lake	Superior Diamonds Inc.	2001-2002	OD	2.26528	53A08/NE-003, 43D05/NW-008, 53A07/NE-003, 53A10/SE-004, 53A10/NE-003, 53A10/NW-003, 53A15/SE-003
Mimmiska Lake	Candor Ventures Corporation	2003	GC	2.27142	52P10/SE-019
Mimmiska Lake	Candor Ventures Corporation	2004	GM, IP	2.28046	52P10/SE-021
Mimmiska Lake	Landore Resources Inc.	2003	GL, DD, Samp	2.27041	52P10/SE-020
North Caribou Lake	Romios Gold Resources Inc.	1998-1999	GEM, GM, Grav, IP, RES	2.20376	53B15/SE-003, 53B16/SW-001
Norton Lake	East West Resource Corporation	2002-2003	DD, Samp	2.26319	42M14/NW-009
Ponsford Township	Kahlert, B. and Mullen, D.	2000	GC, GL, GM, DD, Samp	2.20641	52O08/SE-001, 52O09/SW-018
Poplar Point	Goodman, H.	2003	Pr, Tr, Samp	2.26156	52H09/NE-046
Poplar Point	Goodman, H. and Nelson, T.	2003	Pr, Str, Samp	2.26154	52H09/NE-047
Skinner Lake	Placer Dome (CLA) Limited	2002	AM	2.25867	53B09/SW-001, 53B09/NW-006
Summers Township	Cote, R. and Cote, R.	2003	Pr, Str, Samp	2.27025	42E12/NW-193
Summers Township	Lafontaine, S.	2003	Pr, Str, Samp	2.27272	42E12/SW-060
Upturned Root Lake	DeBeers Canada Exploration Inc.	2002	GC	2.25111/2.25112	52O15/NW-001, 52O14/NE-001, 52O14/SE-001, 52O15/SW-001, 52O15/SE-001, 52O15/NE-001, 52O10/NW-001
Wapitotem	Lake Shore Gold Corp.	2002	AEM, AM	2.26541	43D05/NW-007, 43D05/NE-010
Wesleyan and Fry lakes	D'Silva, B.	2002	GC, Samp	2.27635	52O04/NE-002, 52O03/NW-002
Zeemel Lake	Placer Dome (CLA) Limited	1999	DD, Samp	2.20429	53B09/SW-002, 53B09/NW-007

Table 3. Exploration activity in the Thunder Bay North District in 2004 (keyed to Figures 1, 2 and 3).

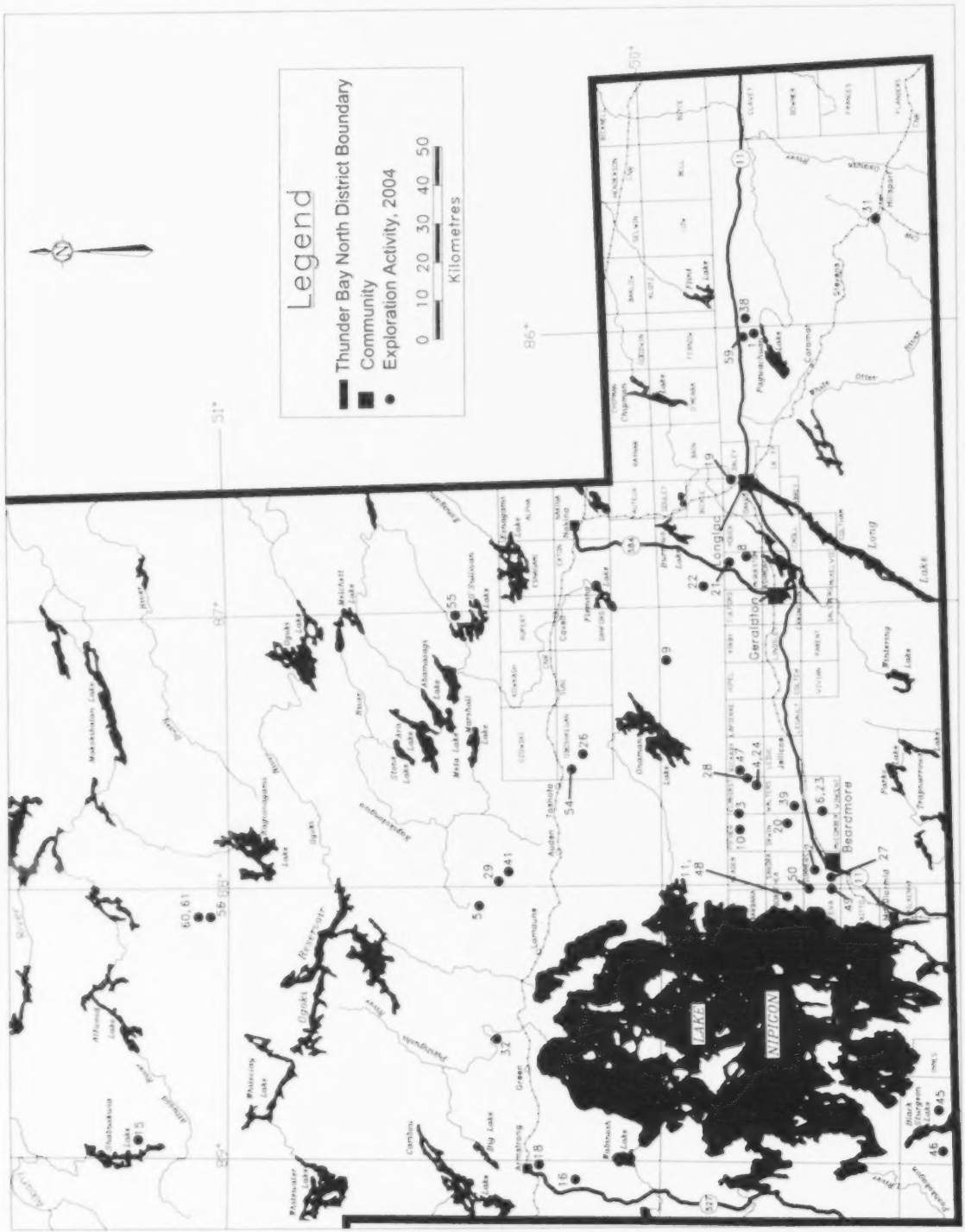
Abbreviations

AEM	Airborne electromagnetic survey	IP	Induced polarization survey
AM	Airborne magnetic survey	Lc	Linecutting
ARA	Airborne radiometric survey	Met	Metallurgical testing
Beep	Beep Mat survey	OD	Overburden drilling
Bulk	Bulk sampling	ODH	Overburden drill hole(s)
DD	Diamond drilling	PEM	Pulse electromagnetic survey
DDH	Diamond drill hole(s)	PGM	Platinum group metals
DGP	Down-hole geophysics	Pr	Prospecting
GC	Geochemical survey	RES	Resistivity survey
GEM	Ground electromagnetic survey	Samp	Sampling (other than bulk)
GL	Geological Survey	Seismic	Seismic survey
GM	Ground magnetic survey	SP	Self-potential survey
GRA	Ground radiometric survey	Str	Stripping
Grav	Gravity survey	Tr	Trenching
HLEM	Horizontal loop electromagnetic survey	UG	Underground exploration/development
HM	Heavy mineral sampling	VLEM	Vertical loop electromagnetic survey
IM	Industrial mineral testing and marketing	VLFEM	Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Albert, O. (Pagwachuan Lake property)	Kassagimini Lake area (Au)	Pr
2	Alto Ventures Ltd. (Cote-Archie Lake property)	Summers Township (Au)	Pr, Str, Tr, Samp
3	Alto Ventures Ltd. (Greenoaks property)	Pither Township (Au)	Compilation
4	Alto Ventures Ltd. (Mud Lake property)	Elmhirst Township (Au)	Pr, Samp
5	Bell Resources Corporation–Stares Contracting Corp. (Falcon property)	Caron Lake area (Cu, Ni)	AEM, AM, DGP, Pr, DDH
6	Buck Lake Ventures Ltd. (Gwyn Lake property)	Vincent Township (Au)	GL, Pr, Str, Samp
7	Candor Ventures Inc.–Nustar Resources Inc. (Miminiska Lake property)	Miminiska Lake area (Au)	GM, IP, DDH, Lc
8	Cote, R. and Cote, M. (Alfred Lake property)	McQuesten Township/Alfred Lake area (Au)	Pr, Str, Samp
9	Cote, R. and Cote, M. (Bernadine Lake property)	Fullerton Lake area (Cu, Ni, PGE)	Pr, Samp
10	Cote, Robert and Cote, Rick (Miner Lake property)	Pither Township (Au)	Pr, Samp
11	Cote, R. (Nortoba property)	Dorothea Township (Au)	Pr, Samp
12	De Beers Canada Exploration Inc. (Kasabonika area properties)	Northwestern Ontario (north half) (diamond)	GC, HM
13	Eastmain Resources Inc.–Slam Exploration Ltd. (Reserve Creek property)	Veekay Lake area (Au)	GC, GL, GM, IP, Pr, Lc, DDH
14	East West Resource Corporation–Canadian Golden Dragon Resources Ltd.–Cascadia International Resources Inc. (Norton Lake property)	Norton Lake area (Pd, Pt, Cu, Ni)	AEM, DDH
15	East West Resource Corporation–Cascadia International Resources Inc. (Linsey Bay property)	Ficht Lake area (Cu, Pb, Zn)	GL, Pr, DDH
16	East West Resource Corporation–Ethelburga Group (Red Granite/Armstrong property)	Pillar Lake area (U, Cu, Ni, Pt, Pd, Au)	ARA, Grav, Pr, DDH, Samp

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
17	East West Resource Corporation–Maple Minerals Corp. (Lang Lake property)	Stoughton Lake area (Cu, Au)	AEM, AM, GEM, GL, IP, Pr, Lc, Samp
18	Fudge and Associates (Armstrong property)	Armstrong area (diabase)	GL, Pr, Samp
19	Golden Chalice Resources Inc. (Brinklow property)	Oakes and Daley townships	Compilation
20	Goodman, H. Jr.	Irwin Township (Au, building stone)	Pr, Samp
21	Greenland, H.	McQuesten and Houck townships (Au)	Pr, Samp
22	Houghton, F. (Greer Road granite property)	Isobel Lake area (building stone)	Pr, Samp
23	Houghton, F. (Gwyn Lake property)	Vincent Township (Au)	Pr, Samp
24	Houghton, F. (Mud Lake property)	Elmhirst Township (Au)	Pr, Samp
25	King's Bay Gold Corp – Richview Resources Inc. (Pickle Lake property)	Connell Township (Au)	GEM, GM, Pr, DDH, Lc, Samp
26	Kodiak Exploration Limited (Knucklethumb Lake property)	Oboshkegan Township (Au)	GC, GL, GEM, GM, IP, Str, Tr, DDH, compilation, Samp
27	Lafontaine, A. (Summers Township property)	Summers Township (Au)	GL, Str, Samp
28	Lafontaine, A. (Wilkinson Lake property)	Rickaby Township (Au)	Pr, Samp
29	Landore Resources Inc. (Lamaune–Junior Lake property)	Falcon Lake area (Au)	IP, Pr, Str, DDH, Samp
30	Landore Resources Inc. (Miminiska Lake property)	Frond Lake area (Au)	DDH
31	Leo Alarie Construction Company (Hillsport Quarry)	Thomas Lake area (diabase ballast)	Quarry production
32	Linear Gold Corp – Noranda Inc. (Kilometre 61 property)	Crescent Lake area (Cu, Mo, Au, Ag)	DDH
33	MacDonald Mines Exploration Ltd. (MacNugget property)	West McFaulds Lake area (Cu, Zn, Au, PGE, diamond)	AEM, AM, DDH
34	McVicar Resources Inc – Millennium Minerals (Kasagiminnis Lake property)	Little Ochig Lake area (Au)	AM
35	MetalCORP Limited (Connell property)	Connell Township (Au)	Str, Samp
36	MetalCORP Limited (Keezhik Lake property)	Keezhik Lake area (Au)	Compilation
37	MetalCORP Limited (Metcalfe property)	Connell Township (Au)	Pr, Str, DDH, Samp
38	Novawest Resources Inc. (Solarus property)	Klotz Lake area (Au)	Pr, DDH, compilation, Samp
39	Pettit, C. (Nora Lake property)	Walter Township (Au)	Pr, Str, Samp
40	PGM Ventures Corporation–Richview Resources Inc. (Thierry Mine property)	Ponsford Lake area (Pd, Pt, Cu, Ni)	GEM, GM, DDH, Lc
41	Pichette, A. (Junior Lake property)	Junior Lake area (Cu, Ni, Au, Pd, Pt)	Pr, Samp
42	Placer Dome Inc.– Kinross Gold Corporation (Musselwhite properties)	Zeemel Lake area (Au)	DD

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
43	Platinex Inc.–Brigadier Gold Limited (Big Trout Lake property)	Nemeigusabins Lake area (Pd, Pt, Cu, Ni)	Compilation
44	Queenston Mining Inc. (Don's Lake property)	Fry Lake area (Au)	Pr, DDH, Samp
45	Rampart Ventures Ltd.– New Shoshoni Ventures Ltd. (Black Sturgeon property)	Mikinak Lake area (U)	ARA
46	Rampart Ventures Ltd.– New Shoshoni Ventures Ltd. (Wolfpup Lake–Black Sturgeon West property)	Mikinak Lake area (U)	ARA, Pr, compilation, Samp
47	Roach, S. (Wilkinson Lake property)	Rickaby Township (Au)	Pr, Samp
48	Roxmark Mines Limited (Nortoba property)	Dorothea Township (Au, Mo)	Pr, Str, Samp
49	Roxmark Mines Limited (Sand River and Leitch Mine properties, East Leitch property)	Eva and Summers townships (Au)	GL, Pr, Str, Tr, Bulk Samp, Samp
50	Rutherford, E. (Eva–Summers property)	Eva Township (Au)	Pr, Str, Samp
51	Slam Exploration Ltd. (Cadman property)	Keezhik Lake area (Au)	DDH
52	Slam Exploration Ltd.– 1533687 Ontario Ltd. (Miminiska–Keezhik Lake property)	Keezhik Lake area (Au)	DDH
53	Solitaire Minerals Corp. (Golden Pickle property)	Connell Township (Au)	Pr, DDH, Samp
54	Spruce Ridge Resources Ltd. (Spruce Hull Lake property)	Oboshkegan Township (Au)	GL, Pr, Str, Tr, Samp
55	Superior Canadian Resources Inc. (Aurum property)	O'Sullivan Lake and Maun Lake area (Au)	GL, Pr, Samp
56	Superior Canadian Resources Inc. (Sim Lake property)	Sim Lake area (Pt, Pd, Cu, Ni)	AEM, AM, Pr, Samp
57	Superior Diamonds Inc. (AEM project)	Lansdowne-Muskrat Dam areas (diamond)	GC, HM
58	Superior Diamonds Inc.– Inco Limited (Winisk project)	Northwestern Ontario (north half) (diamond)	GC, HM
59	Teck Cominco Limited (Adel property)	Klotz Lake area (Au)	GL, Pr, Str, Tr, Samp
60	Thibault, D. (Sim Lake property)	Sim Lake area (Cu, Ni, Pt, Pd)	Pr, Str, Samp
61	Wheeler, J. (Sim Lake property)	Sim Lake area (Cu, Ni, Pt, Pd)	Pr, Str, Samp


Legend
Thunder Bay North District Boundary
Community
Exploration Activity, 2004
0 10 20 30 40 50
Kilometres
LAKE
NIPIGON
Geraldton
Beardmore
Longlac
Lake
Long
Jellicoe
Armstrong
Pic
Nipigon
Orient
Black
Otter
Pye
Patrick
Gravel
Jackfish
Jan
Jellicoe
Aubin
Tashota
Ridout
Pashkokogan
Kenogami
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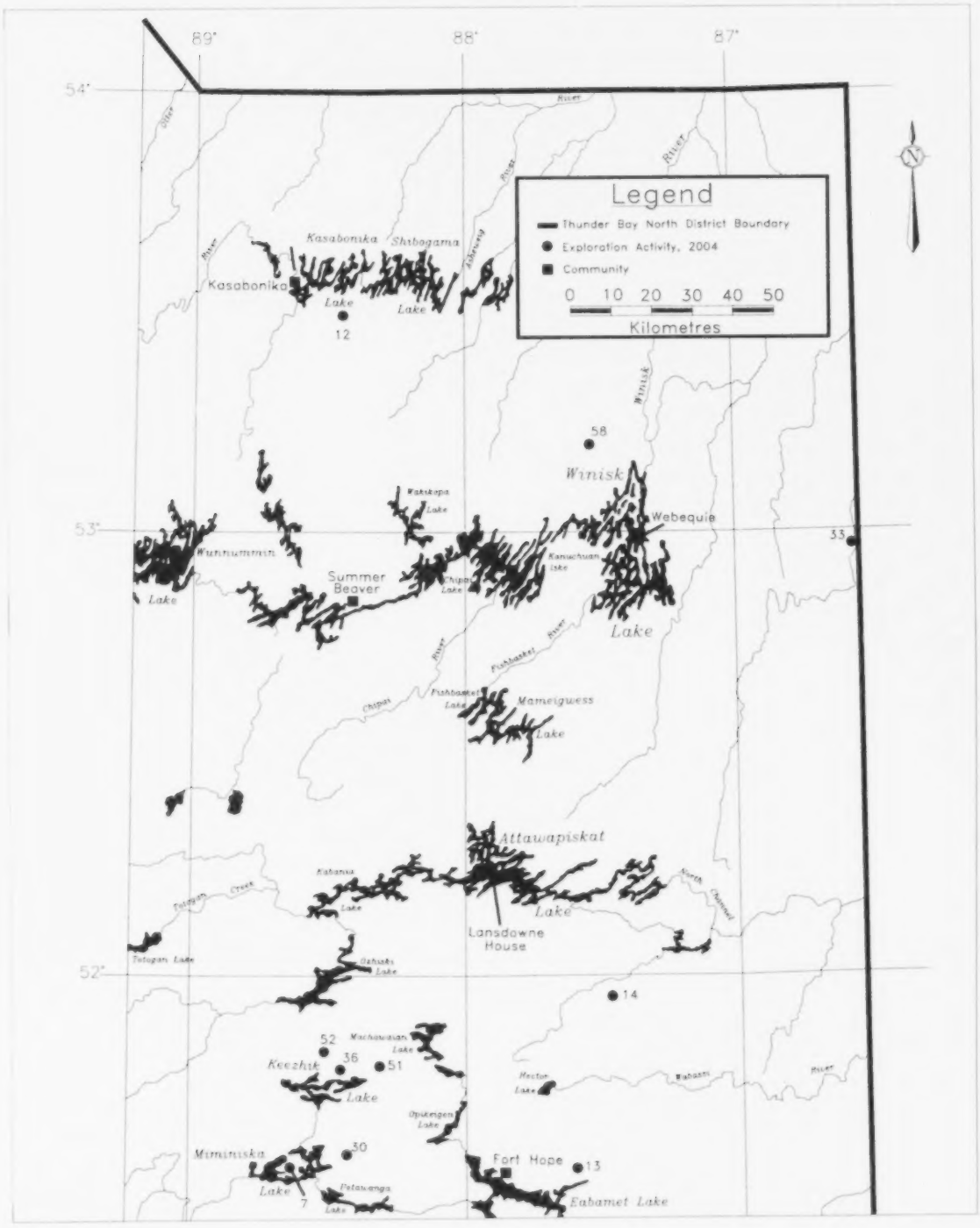

Figure 2. Thunder Bay North District (northeast map) exploration activity, 2004 (keyed to Table 2).

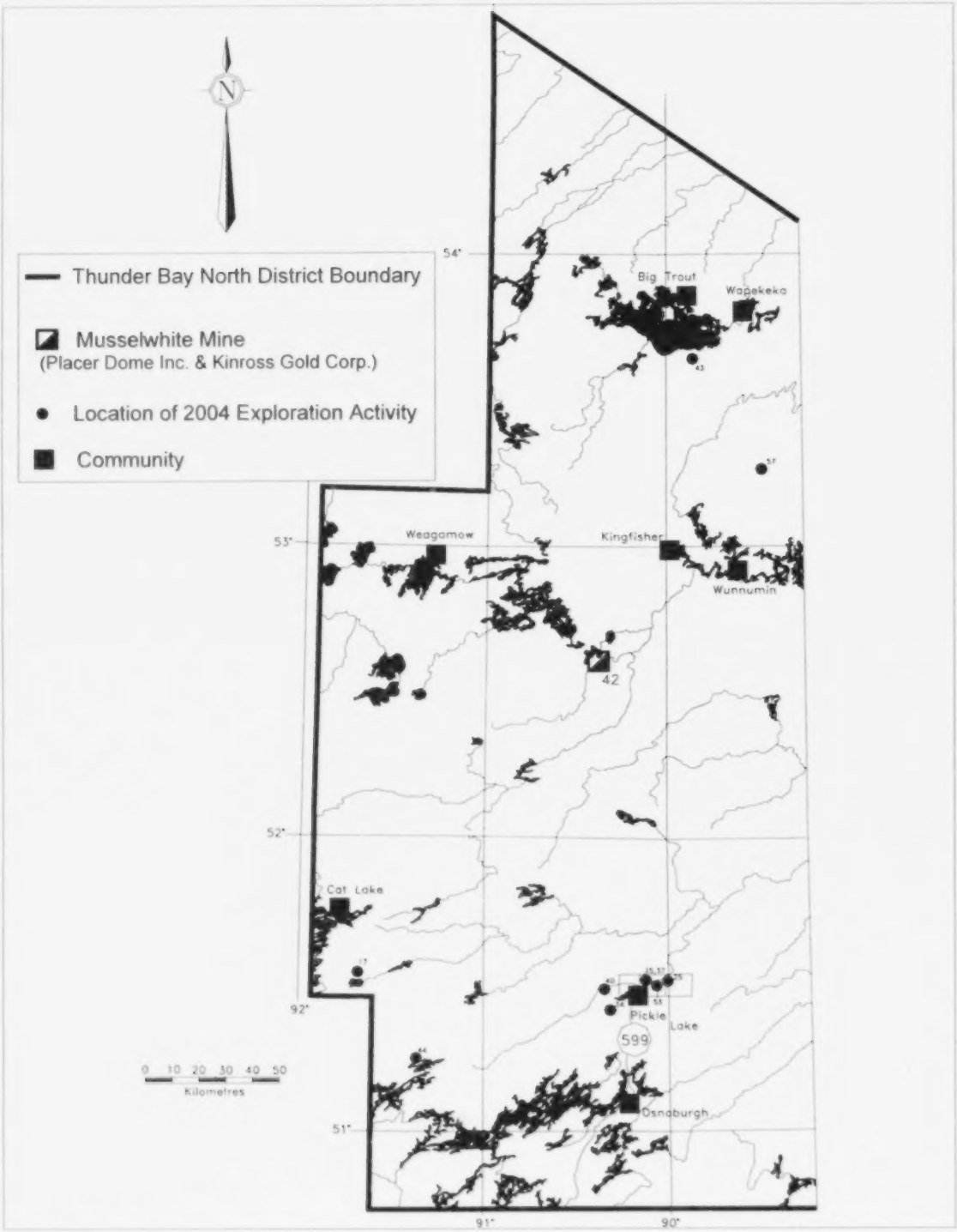

Figure 3. Thunder Bay North District (northwest map) exploration activity, 2004 (keyed to Table 2).

RESIDENT GEOLOGIST STAFF AND ACTIVITIES

In 2004, the Thunder Bay North Resident Geologist Program (RGP) comprised Mark Smyk, P.Geo. (Regional Resident Geologist); Gerry White, P.Geo. (District Geologist); Angelique Magee (District Support Geologist) and Cyndee Komar (Administrative Assistant). Significant support was also provided by Desiree Wyant (GIS/Data Specialist), Abraham Drost, P.Geo. (Regional Land Use Geologist), Peter Moses (First Nations Minerals Information Officer), John Mason, P.Geo. (Northwest Regional Manager, RGP) and Mike Grant and Mark O'Brien (Mineral Development and Lands Branch), especially in dealing with Far North and First Nations issues.

In 2004, 55 property visits were conducted to 39 properties (Table 4). RGP staff dealt with 1031 visitors and 935 telephone, and electronic mail inquiries in the Thunder Bay office, as well as in the Beardmore and Geraldton satellite offices. The Beardmore office, established in 1996 in conjunction with the community of Beardmore, was staffed one day per week from May to October. The Geraldton office, co-located in the Northern Development Officer's office, was staffed one day per month during the same time period. Thunder Bay North RGP staff attended or assisted in the production of materials for the following symposia in 2004: Cordilleran Round-Up, Vancouver (display); Prospectors and Developers Association of Canada Annual Meeting, Toronto (display); Northwest Ontario Mines and Minerals Symposium, Thunder Bay (presentation and display); Institute on Lake Superior Geology, Duluth, Minnesota (presentation and display); Manitoba Mining and Minerals Convention, Winnipeg (display) and the Ontario Exploration and Geoscience Symposium, Toronto (presentation and display). M. Smyk served on the Science Committee for the Lake Nipigon Region Geoscience Initiative and as Treasurer of the Thunder Bay Branch, Canadian Institute of Mining and Metallurgy. He assumed the position of Co-Chair of the 51st Institute on Lake Superior Geology and began organizational work on the meeting, scheduled for May 2005 in Nipigon. G. White continued in his position as Health and Safety Co-ordinator for the Thunder Bay Mines and Minerals office and co-ordinated tasks associated with the proposed divestiture of the Thunder Bay Drill Core Library. A. Magee started field work and courses related to her MSc thesis requirements at Lakehead University (part-time).

Table 4. Property visits conducted in the Thunder Bay North District in 2004.

Number	Property or Occurrence
1	Adel Lake: Au[R]
2	Alfred Lake–False Creek[R]
3	Archie Lake (R. Cote–Alto Ventures Ltd.): Au
4	Bankfield Mine: Au
5	Bernadine Lake (R. & M. Cote)[PE]: Cu-Ni-PGE
6	Blackwater Fault
7	Central Patricia Mine[FT]: Au
8	Dona Lake Mine[FT]: Au
9	Dunning Pegmatite
10	East Leitch (Roxmark Mines Limited): Au
11	Foster Pegmatite: Li
12	Greer Road
13	Hard Rock Mine: Au
14	Hutchison (Maylac) Mine: Au
15	Kilometre 61 (Linear Gold Corp.–Noranda Inc.)[PE]: Cu, Au, Mo
16	Knucklethumb–Kipper-Cameron (Kodiak Exploration Limited)[PE]: Au
17	Knucklethumb–Vent Area (Kodiak Exploration Limited)[PE]: Au
18	Knucklethumb–Wobbegong (Kodiak Exploration Limited)[PE]: Cu, Zn
19	Lincoln (NWT Copper Mines Ltd.): Au
20	MacLeod–Cockshutt Mine (Barrick Gold Corporation): Au
21	Magnet Mine (Roxmark Mines Limited): Au
22	Metcalfe (MetalCORP Limited): Au

Number	Property or Occurrence
23	Missing Link: Au
24	Mud Lake (F. Houghton–Alto Ventures Ltd.): Au
25	Nipigon–Quetico/Quaternary
26	Nora Lake–Wenzoski (C. Pettit): Au
27	Northern Empire Mine (Roxmark Mines Limited): Au
28	Northwest Geraldton Reconnaissance
29	Opikeigen Lake
30	Paglamin Lake (Milestone Exploration Limited)[R]: Au
31	Pickle Crow Mine (Wolden Resources Inc.)[FT]: Au
32	Pillar Lake (East West Resource Corp.–Ethelburga Group): Cu-U-REE-Ni
33	Poplar Lodge
34	Rich Lake: Au
35	Sand River–Leitch Mines (Roxmark Mines Limited): Au
36	Spawn Lake (H. Goodman, Jr.): Au
37	Spruce Hull Lake (Spruce Ridge Resources Ltd.)[PE]: Au
38	Thierry Mine (PGM Ventures–Richview Resources Inc.)[FT]: Cu-Ni-PGE
39	Willet–Gripp Lakes: Cu-Zn-Au

[R] described in "Recommendations for Exploration"

[PE] described in "Property Examinations"

[FT] visited during field trip conducted by Resident Geologist's staff in 2004

PROPERTY EXAMINATIONS

Bernadine Lake

The Bernadine Lake property was staked in 2004 by local prospectors Robert and Marcel Cote following their discovery of copper-nickel-platinum group element (PGE)-bearing sulphide mineralization. It is situated in a large area of cut-over, approximately 44 km along the Greta Lake road network northwest of Geraldton. The area is underlain by a variety of meta-intrusive rocks that form the southern margin of the Neoarchean Onaman pluton. Following regional mapping and compilation, Stott et al. (2002) noted tonalite to granodiorite gneiss with late granitic dikes and amphibolitic inclusions near Bernadine Lake. This lithologic unit is flanked to the south by medium- to fine-grained granodiorite to tonalite. Mafic metavolcanic rocks of the Onaman assemblage, exposed in the Altitude Lake area, become increasingly schistose and amphibolitic near the pluton (ibid.). Kresz (1991) mapped a gabbro along the base of the Onaman assemblage in contact with the felsic, Onaman plutonic rocks to the northeast.

In the vicinity of the initial discovery (Main Showing), the country rock consists of foliated, medium-grained, grey-white, tonalite gneiss. Gneissosity is variable, but generally is north-trending and dips moderately to steeply to the west. The tonalitic gneiss hosts numerous mafic and ultramafic xenoliths (i.e., outcrop-scale) and enclaves (i.e., on the order of tens of metres) and is cut by pink granitic, epidotized pegmatite dikes. There are 3 predominant xenolith types: 1) amphibole-biotite-quartz-feldspar (metasedimentary?) schist; 2) massive, homogeneous, medium-grained gabbro or diorite; and 3) massive, fine-grained ultramafic rocks. Local partial melting has produced agmatitic (brecciated) migmatites with quartzo-feldspathic leucosome veins.

The Main Showing is hosted by a 5 m wide ultramafic enclave that is exposed over 15 m in outcrop. The ultramafic host is fine grained, non-magnetic, foliated, dark green, chloritic, talcose and locally biotitic and feldspathic. It is bounded by tonalitic gneiss and crosscut by quartzo-feldspathic dikelets. Fine-grained, disseminated to net-textured pyrite, chalcopyrite and pentlandite produce small, gossanous patches. Malachite is also present along fracture surfaces. A drilled, grab sample taken by the property owners returned >6000 ppm Cu, >5000 ppm Ni, 4880 ppb Pd, 616 ppb Pt and 126 ppb Au (Resident Geologist's files, Thunder Bay North District, Thunder Bay). Some sulphide minerals also occur in crosscutting felsic dikes and perhaps represent remobilization of primary, ultramafic-hosted mineralization. The following table lists samples collected by the authors and the associated assay results:

Sample Number	UTM Location (NAD83)	Sample Description	Au (ppb)	Cu (ppm)	Ni (ppm)	Pd (ppb)	Pt (ppb)
04 MBL-01	Main Showing 476730E 5533800N	massive, non-foliated, non-magnetic, amphibolitized, talcose, biotitic ultramafic; disseminated to wispy pyrite+chalcopyrite+pentlandite ≤2%; strong reaction to dimethyl glyoxime	N.D.	3996	2521	60.2	13.1
04 MBL-02	Main Showing 476730E 5533803N	as above, but biotitic, foliated, some sulphide veinlets	17.28	4933	5189	524	125
04 MBL-03	Main Showing 476728E 5533803N	pink, medium-grained granitic dike intruding -02; disseminated to blebby chalcopyrite + malachite ≤3% in dike and along margins in wall rock	N.D.	4271	748	14	2.78
04 MBL-04	Main Showing 476746E 5533764N	similar to -02; disseminated sulphides ≤1%	N.D.	589	1709	10.9	3.42
04 MBL-05	Main Showing 476746E 5533767N	white-grey, medium-grained tonalite near ultramafic; disseminated to blebby chalcopyrite + malachite ≤2%	21.52	2751	419	62.2	13.4
04 MBL-06	West of Main Showing 476574E 5533968N	biotitic ultramafic enclave in tonalite gneiss; disseminated pyrite ≤1%	N.D.	1608	1546	6.49	2.04

(Resident Geologist's Files, Thunder Bay North District, Thunder Bay)

Despite the lack of continuity of the favourable ultramafic host rocks, the discovery of copper-nickel-PGE-bearing sulphide mineralization warrants additional prospecting for the *in-situ* ultramafic source(s). The ubiquity of mafic and ultramafic xenoliths and/or enclaves in this part of the Onaman pluton suggests proximity to a major intrusive contact near the margin or roof of the pluton. Copper-nickel-PGE mineralization was described at Final Lake by Mason et al. (2001) in the gabbro unit mapped by Kresz (1991). This area warrants investigation and a reappraisal of its copper-nickel-PGE potential.

Oboshkegan Township: Knucklethumb and Spruce Hull Properties

Renewed exploration activity on the Knucklethumb and Spruce Hull Lake properties in Oboshkegan Township by Kodiak Exploration Limited and Spruce Ridge Resources Ltd., respectively, resulted in the extension and/or better definition of known gold and base metal occurrences and the discovery of new ones. This work has led to a better understanding of the characteristics and controls on mineralization in this part of the Onaman–Tashota greenstone belt.

KNUCKLETHUMB PROPERTY

Several property visits were made to Kodiak Exploration Limited's Knucklethumb property in Oboshkegan Township to investigate and document a number of occurrences and zones. A synopsis of significant 2004 drilling results was provided by Kodiak (Kodiak Exploration Limited, news release, January 17, 2005):

Drill Hole	Zone or Showing	Intersection Width (m)	Au (g/t)	Description
KL04-01	Claim Line	1.15	1.43	3.95 m wide quartz-tourmaline stockwork
KL04-01	Claim Line	1.50	9.25	Visible gold in quartz
KL04-05	JAZ	0.50	0.76	2.03 m wide quartz-tourmaline stockwork
KL04-08	Wobbegong	0.54	0.35	2.20 m wide zone of disseminated to massive sulphide
KL04-11	Kipper–Cameron	0.67	2.66	7.87 m wide quartz-tourmaline stockwork
KL04-18	Thor Shear	0.50	0.20	18.6 m zone of disseminated to massive sulphide
KL04-19	Thor Shear–Colby	0.40	0.44	7.7 m wide disseminated sulphide zone
KL04-20	Kodiak	0.20	5.78	Visible gold in quartz vein in 3.85 m wide carbonate-fuchsite alteration zone

The **Kipper–Cameron** block of the Knucklethumb property is underlain predominantly by mafic metavolcanic rocks and medium-grained gabbroic sills. Narrow (1 to 2 m) gold-mineralized shear zones appear to be splaying structures from a main east-trending structure that extends into the Kipper–Cameron East zone. Quartz veins are hosted by sheared, silicified, iron carbonatized and sulphidized mafic metavolcanic rocks. Pyrite, chalcopyrite, sphalerite and tourmaline occur in these steeply dipping veins. Quartz-feldspar porphyry dikes appear to postdate the carbonatization of the basalts. Sampling by RGP staff in 2004 returned the following assays:

Sample Number	Zone or Showing	Grab Sample Location (NAD83)	Au (ounces/ton)	Ag (ounces/ton)	Description
04 MKC-01	Kipper–Cameron shaft area	456440E, 5557573N	N.D.	1.4	white quartz-carbonate veins in Fe-carbonatized, chloritic metavolcanic host; rare, fine-grained pyrite
04 MKC-03	Kipper–Cameron south of main zone (old pit)	456284E, 5557542N	0.18	N.D.	20-30 cm quartz- carbonate vein at contact between basalt and QFP; fine-grained, <1% disseminated pyrite

(Resident Geologist's Files, Thunder Bay North District, Thunder Bay)

Deformed and altered, quartz-phyric, felsic metavolcanic rocks in the **Vent Area** (UTM location: 465603E, 5556489N) are flattened (110/70N) and display well-developed mineral lineations. Analysis by the OGS in 2004 confirmed the presence of kyanite, which had previously been restricted to a small area noted by Stott and Parker (1996) (Resident Geologist's files, Thunder Bay North District, Thunder Bay). As described by Kodiak Exploration Limited (news release, January 17, 2005), the Vent alteration system is typified by widespread and intense sodium depletion and pyritization. Assay values of up to 2.68 g/t Au, 107 g/t Ag and 0.59% Cu have been reported. A petrographic study by Kodiak confirmed the presence of barite and an extensive, metamorphosed aluminosilicate (mainly kyanite) alteration zone, with sericite and pyrophyllite alteration, and intense quartz flooding (85% SiO_2). Chloritoid was also identified locally. The study also identified the presence of electrum and silver sulphosalts such as boulangerite and tetrahedrite, which perhaps account for local gold-silver-antimony-arsenic-lead lithogeochemical anomalies. Chalcopyrite, covellite, and sphalerite were also identified. Their presence supports a possible volcanogenic massive sulphide model, in addition to polymetallic gold mineralization (ibid.).

SPRUCE HULL PROPERTY

A gold-mineralized zone was discovered by Spruce Ridge Resources Ltd. in 2004 on their Spruce Hull Lake property, east of Hull Lake. The Black Dog Zone (UTM location: 457545E, 5557247N) was exposed in a newly stripped area 160 m long and up to 55 m wide, 1.2 km southeast of the areas stripped in 2003 (cf. Smyk et al. 2004). Chloritized and sheared mafic metavolcanic rocks are intruded by quartz porphyry dikes and contain widespread disseminated pyrite and an extensive quartz stringer system. One cluster of quartz stringers contains coarse, visible gold. One series of channel samples returned an average of 3.03 g/t Au across 4.50 m, including a 0.30 m section returning 30.87 g/t Au, where visible gold was observed (Spruce Ridge Resources Ltd., news release, January 25, 2005).

Rich Lake Occurrence

The Rich Lake gold occurrence is located in the Fort Hope greenstone belt, eastern Uchi Subprovince, approximately 13 km northwest of Eabametoong First Nation and 1 km south of the southern end of Opikeigen Lake. The exploration history has been documented by Mason and White (1995). Burwash (1930) of the Ontario Department of Mines reported on this gold occurrence, known as the Irish Wording property. Prest (1944) reported that stripping, trenching and drilling had been carried out by the Rich Lake Patricia Syndicate in 1941. A number of individuals and companies have held claims covering the occurrence. Pure Gold Minerals Inc. acquired the property in 1987 and is the current owner. Joint-venture partner, Noramco Explorations Inc., completed an extensive drilling program between 1987 and 1989.

The occurrence was visited in 2004 with L.A.F. Hall, Precambrian Geoscience Section, OGS, during her 1:20 000 bedrock mapping program in the Opikeigen Lake area (Hall 2004). Quartz veins are exposed on top of an east-trending ridge in amphibolitized, mafic metavolcanic rocks. The main occurrence (UTM location: 421236E, 5719181 3N) lies near the western end of the series of stripped areas and trenches that extends along the top of the

ridge for approximately 300 m. Metavolcanic host rocks, foliated at 090/80S, are cut by calcite-filled veinlets and host the east-trending, parallel set of gold-mineralized quartz veins. The quartz is sugary, recrystallized and displays a "crack-seal" texture with biotite and amphibole septa. Two grab samples collected from the main trench and from dump material containing sparsely disseminated, fine-grained pyrite, returned 0.14 and 0.12 ounce gold per ton, respectively (Resident Geologist's files, Thunder Bay North District, Thunder Bay). Scheelite had long been noted in these veins (Wallace 1978), but was not found (using ultraviolet light) in samples collected in 2004.

Despite the relative lack of host rock alteration and paucity of sulphide mineralization, the Rich Lake veins carry appreciable gold values. Although some work has been carried out in the vicinity of the Rich Lake occurrence, many areas, especially those obscured by overburden, remain untested. New mapping and structural interpretations by Hall (2004) in the area should be used to develop an exploration strategy in this highly prospective greenstone belt.

Kilometre 61 Property

The Kilometre 61 polymetallic (Cu-Mo-Au-Ag) property is located approximately 47 km east-northeast of Armstrong and is currently held by Linear Gold Corp. Noranda Inc. optioned the property in 2003 (Linear Gold Corp., news release, November 3, 2003). The Kilometre 61 property is accessed by a logging road which extends off the Jackfish Road at the marker for kilometre 61. It lies within the northern portion of Linear's Seymour Lake rare metal-bearing pegmatite property. The discovery of the Cu-Mo-Au-Ag-mineralized porphyry was made by prospectors S. & M. Stares in 2002 in float boulders and outcrops along the newly constructed logging road.

The area is underlain by the Neoarchean Caribou greenstone belt that has been explored for magmatic Cu-Ni-sulphide, lode gold, REE-bearing pegmatites and volcanogenic massive sulphides since the 1950s. The earliest record of gold exploration in the area is circa 1915 (Pye 1968). The Caribou greenstone belt trends east-northeasterly, north of Lake Nipigon and follows the northern margin of the Wabigoon Subprovince, which is marked by the Sydney Lake–Lake St. Joseph Fault zone. It extends east to the Onaman–Tashota greenstone belt (Pye 1968).

The Kilometre 61 property is underlain by a prominent, south-southwest-trending arm of the belt that wraps around the northwestern end of a large, composite felsic pluton comprised of tonalite and granodiorite with lesser granite, monzonite and diorite phases. South-southwest-trending, sinistral faults cut this arm of the belt (Pye 1968). Mesoproterozoic Inspiration diabase sills of the Midcontinent Rift form prominent plateaus in the property area, which is near the northern margin of the Nipigon embayment (MacDonald, Tremblay and Easton 2004).

The local geology consists of apophyses of a granodiorite pluton interfingering with mafic metavolcanic rocks. The metavolcanic rocks are composed of massive to porphyritic basalts with minor gabbroic units. Clastic metasedimentary rocks, Fe-sulphide-magnetite-bearing iron formation, and a felsic metavolcanic unit are intercalated with the mafic metavolcanic rocks (Rees 2004). Tonalite sheets and a plug of two-mica granite occur along the granodiorite contact. The Cu-Mo-Au-Ag-bearing, granodioritic, "quartz-eye" porphyry is marginal to the granodiorite contact area and occurs as a series of northeast-trending, eastward-coalescing dikes. The porphyry dike displays pervasive sericite-quartz (phyllic) alteration, including intense quartz stockwork development, which locally becomes biotite- (potassic) altered. Several types of breccia are exposed, including a marginal, intrusive breccia that occurs along the porphyry dike contacts and is several metres wide. An internal "crackle" breccia was noted within the porphyry dikes in association with enclaves of mafic metavolcanic rocks. The mafic metavolcanic rocks that are intercalated with the porphyry are propylitically altered, with progressive, actinolite to epidote to chlorite alteration of the wall rocks, or as gangue in the quartz stockwork (ibid.). The foliation in the metavolcanic rocks varies from 050/80SE to 070/80SE and is consistent across volcanic and intrusive contacts. Mineralization of the quartz porphyry in the zones of phyllic and potassic alteration is characterized by disseminated chalcopyrite, molybdenite, pyrite, and minor pyrrhotite in massive porphyry, in brecciated porphyry and in the quartz stockwork and stringer veins. Mineralization is not associated with the propylitic alteration (Rees 2004).

Five trenches were excavated in the mineralized zones; grab and channel samples were taken (Linear Gold Corp., http://www.lineargoldcorp.com/property_view.php?property_id=22). Chalcopyrite, pyrite and molybdenite occur as fracture fillings and disseminated grains associated with quartz veins and associated silicification in the porphyry dikes, and adjacent felsic and mafic metavolcanic rocks. The mineralization is most extensive where quartz veins cut

the mafic metavolcanic rocks. Wide zones of copper mineralization, with values up to 0.2% Cu over 30 m, were noted. Grab sample values up to 3.5 g/t Au, 348 g/t Ag and 2.4% Cu, as well as 3 samples which returned >500 ppb Au and up to 73 g/t Ag were also reported. The highest molybdenum values were 2.55% Mo (with 1265 ppb Au, 27 ppm Ag and 0.37% Cu) and 1.14% Mo (with 13 ppm Ag and 0.44% Cu) (ibid.).

Noranda Inc. carried out a five-hole diamond drilling program (totalling 1178 m) in August 2004 to test the western end of an induced polarization (IP) chargeability anomaly of 500 m by 1000 m over a strike length of 100 m (Linear Gold Corp., news release, December 24 004). Drill hole K-04-04 returned the best values, including 0.08% Cu and 0.047% Mo over 131 m; this portion of the mineralized zone remains open to depth. The northern porphyry body intersected by hole K-04-05 averaged 0.07% Cu over 87 m, while a porphyry breccia zone at depth returned 0.19% Cu, 0.04% Mo, and 4.5 g/t Ag over 12.5 m. Both holes were 100 m step-outs to the east, suggesting the potential for a copper-gold-rich zone in the core of the system along strike to the northeast (ibid.).

The Road Trench (UTM location: 399296E, 5587219N, NAD27, Zone 16) exposes nonmineralized, undeformed porphyry adjacent to brecciated porphyry which returned 0.3 to 0.4% Cu and 0.02 g/t Mo (M. Rees, Noranda Inc., personal communication, 2004). This is the same brecciated unit that was drilled by hole K-04-05. A grab sample at the Road Trench collected by Resident Geologist Office Staff in 2004 returned 0.3% Cu and 0.02% Mo (Resident Geologist's Files, Thunder Bay North District, Thunder Bay).

An increase in exploration activity in the Armstrong area in 2004 resulted from the release of Lake Nipigon Region Geoscience Initiative data and maps covering the Nipigon Embayment. The Armstrong area boasts an extensive, ever-increasing, logging road network. The Kilometre 61 property represents a hitherto unrecognized exploration target and local mineral deposit model. The value of prospecting, especially along new road networks, is reiterated by this discovery. The area has an under-appreciated potential for a variety of other mineral deposits as well, including lode gold, volcanogenic massive sulphide copper-zinc, orthomagmatic copper-nickel and rare metal-bearing pegmatites.

RECOMMENDATIONS FOR EXPLORATION

Gold

GOLD IN THE EASTERN EXTENSION OF THE BEARDMORE–GERALDTON BELT

Recent work by Teck Cominco Limited and Novawest Resources Inc. (*see* "Exploration Activity") east of Pagwachuan Lake, 50 km east of Longlac, has reinforced the gold potential of this largely overlooked portion of the Beardmore–Geraldton belt. Much of the previous prospecting and exploration activities were hindered by extensive overburden and lack of outcrop in many areas. Amukun (1984) mapped and recommended the area for gold exploration, citing similarities to the past-producing Geraldton camp. The continuity of the banded iron formation from the MacLeod–Cockshutt–Hardrock mines area to north of Pagwachuan Lake is revealed on the regional airborne magnetic survey (Ontario Geological Survey 1989).

Most of the observed shear zones and other key structures were noted in the vicinity of known gold occurrences. It is recommended that these shear zones be traced by prospecting and stripping and their extensions extrapolated on the basis of strained and altered rocks within and flanking these zones have been converted into biotite-, chlorite-, sericite- and/or carbonate-bearing schists.

Major faults, such as the one that extends through Klob, Adel and Pyro lakes, may be manifested as mylonites. At Adel Lake, the mylonitic, felsic intrusive rocks display a rotated C-S fabric, indicative of a dextral regional-scale fault (G.M. Stott, OGS, personal communication, 2004). It may be the eastern extension of the Burrows River fault or deformation zone, which has been traced through Fulford and McQuesten townships by Beakhouse (1989) and Croll, Houck and Oakes townships and Daley Township by Kresz and Zayachivsky (1991, 1993), respectively. Although Kresz and Zayachivsky (1993) suggested that the Burrows River deformation zone ended within the Croll Lake stock, gneissic granitic rocks persist to the east where they are extensively covered by overburden. Although such major faults are not commonly mineralized, subordinate splay structures typically host gold occurrences.

Deformed and altered rocks and any quartz-carbonate veins in the vicinity of such structures should be systematically sampled. Arsenopyrite is locally a good pathfinder mineral for gold. It has been noted in association with gold mineralization in sulphidized banded iron formation, clastic sedimentary rocks, quartz porphyry and quartz-carbonate veins (Amukun 1984; Macdonald 1938).

The Paglamin Lake granodiorite stock and its environs is also recommended as a focus for exploration. Gold occurrences (e.g., Caramat Gold Mines; Adel Lake; west of Secon Lake) are associated with sheared and altered zones in felsic intrusive rocks and flanking clastic metasedimentary rocks with quartz-carbonate veining. This stock may be analogous to the Croll Lake stock, which is regarded by some researchers as the source of mineralizing fluids in the Geraldton camp. This relatively under-explored area warrants further investigation.

GOLD IN THE PIFHER AND ELMHIRST TOWNSHIPS AREA

The current resurgence in the price of gold has focussed exploration attention in the south-central portion of the Onaman–Tashota belt. Detailed prospecting work and gold discoveries by R. Cote in 2004 on his Miner Lake property in northeastern Pifher Township, and the acquisitions by Alto Ventures Ltd. of the Greenoaks and Houghton–Mud Lake gold properties in 2004 in Elmhirst Township, highlight this fact.

The area is predominantly underlain by intermediate to felsic metavolcanic rocks, feldspar porphyry intrusions and the Elmhirst and Coyle Lake granodioritic stocks (Mackasey and Wallace 1978; Kresz and Zayachivsky 1989). Chalcopyrite associated with feldspar porphyry dikes and sills, in close proximity to the margins of these felsic intrusions, should be examined for gold mineralization. Stott and Straub (1999) indicated that these intrusive bodies produced a strain aureole in the surrounding metavolcanic rocks, which has locally resulted in iron carbonate and/or sulphide alteration. The Cote–Miner Lake property and the Augmitto Exploration occurrence in east-central Pifher Township are examples of this style of mineralization.

Detailed sampling conducted by prospector R. Cote at Miner Lake returned significant gold values. Channel sampling returned values of up to 3.56 g/t Au and 9312 ppm Cu over 1 m (Resident Geologist's files, Thunder Bay North District, Thunder Bay). A chip sample from another trenched area returned 2.397 g/t Au and 7447 Cu, supporting the relationship between gold and copper mineralization (ibid.).

The location of copper-bearing, shear-hosted quartz veins within metavolcanic rocks along northeast-trending structures is also important to note. This type of mineralization was well documented by Kresz and Zayachivsky (1989) and was observed by the authors at the Crooked Green Creek, Greenoaks and Quebec Sturgeon River Mine properties, as well as at the Mud Lake property in south-central Elmhirst Township (Mason et al. 1999). Kresz and Zayachivsky (1989) provided specific suggestions for mineral exploration in this area. They suggested the following controlling factors:

1. major faults with associated ductile shear zones;
2. lithologic contacts between rocks with high competency contrast that focussed ductile and brittle fracturing during deformation;
3. fold axes; and
4. zones of pervasive alteration and secondary mineralization (quartz, alkali feldspar, carbonate, tourmaline, and disseminated sulphides).

Special attention should be given to lineaments that appear on aerial photographs, as they may represent surface expressions of lithologic contacts or fracture zones.

Diamonds

DIAMOND POTENTIAL OF THE NORTHERN EXTENSION OF THE TRANS-SUPERIOR TECTONIC ZONE

The Trans-Superior tectonic zone (TSTZ) extends north from Lake Superior near Marathon to north of Highway 11. It hosts a number of intrusions associated with the Mesoproterozoic Midcontinent Rift (Coldwell and Killala Lake complexes; Prairie Lake carbonatite complex). Its presence in the Geraldton area is suggested by the occurrences of carbonatite dikes and fenites near Chipman Lake (Sage 1985). In the summer of 2004, G.M. Stott (Precambrian Geoscience Section, OGS) noted previously undiscovered carbonatitic rocks west of Alfred Lake, approximately 15 km north-northeast of Geraldton. Greyish white, annealed, equigranular silico-carbonatite intrudes mafic metavolcanic rocks and banded iron formation near the contact with granitic rocks to the north (UTM location: 513348E, 5520401N). A carbonatized mica peridotite was noted by Kresz and Zayachivsky (1991) in a road cut on Highway 11 in southwestern Oakes Township. The 50 cm wide dike has intruded the Croll Lake granodiorite stock just south of the Suckle Lake aggregate quarry.

There has been considerable debate as to the relationship of carbonatitic to kimberlitic rocks. Regardless, the presence of carbonatitic rocks and ultramafic dikes in the TSTZ indicates that the controlling structures are deep-seated, extending to the upper mantle. The diamond potential of the TSTZ was suggested by Schnieders, Smyk and McKay (1993). As reported in 2004, a 19.83 kg sample taken from the Ripple Lake lamprophyric diatreme near Marathon by Ripple Lake Diamonds Inc. in 2003 returned 3 microdiamonds (Ripple Lake Diamonds Inc., prospectus, September 28, 2004, can be viewed through search on http://www.sedar.com). Further investigation of these and other mantle-derived intrusions is recommended in the TSTZ as well as throughout the Thunder Bay North District.

Iron Oxide–Copper–Gold (IOCG)

IOCG TARGET IN THE FORT HOPE AREA

Ongoing analysis of the Fort Hope area high-density, regional lake sediment geochemical survey (Ontario Geological Survey 2001) has revealed an area of highly anomalous and coincident copper and uranium values in a broad area extending from Opikeigen Lake, through Hector Lake and east to Norton Lake. This area roughly follows the northern margin of the Fort Hope greenstone belt. Values of up to 107.21 ppm U (the highest of all the survey results) and 22 ppm Cu were returned from lake sediments southwest of Norton Lake (sample site # 353). An investigation of this area for its IOCG potential is recommended.

OGS ACTIVITIES AND RESEARCH BY OTHERS

1. Projects associated with the Lake Nipigon Region Geoscience Initiative (LNRGI) were initiated in 2003 and continued in 2004 (Rayner, Lane and Easton 2003; Rayner 2004). They include
   - Geological mapping in the southern (Tom Hart, Precambrian Geoscience Section, OGS) and west-central (Carole Anne MacDonald, Precambrian Geoscience Section, OGS) areas of the Nipigon Embayment, respectively, (Hart and Whaley 2004; MacDonald, Tremblay and Easton 2004)
   - A petrology project, initiated in 2004, to complement OGS bedrock mapping
   - Aeromagnetic and gamma ray spectrometry survey over a large area west of Lake Nipigon, completed in 2003
   - Ground-based gravity survey conducted west and south of Lake Nipigon, completed and released in 2004
   - Audio magnetotelluric surveys by J. Craven (Geological Survey of Canada), in 2004, to provide deep crustal profiles across the western edge of the Nipigon Embayment
   - Paleomagnetic study of mafic dike swarms by R. Ernst (Geological Survey of Canada) to provide insight into magmatism in the Nipigon Embayment

- Geochronologic sampling and analysis of key stratigraphic units by Larry Heaman (University of Alberta)
- Surficial geochemical and Quaternary case studies of 5 key areas as follow-up to nickel and platinum group element anomalies generated by earlier Operation Treasure Hunt lake sediment surveys (Dyer 2004; Barnett 2004; Dyer and Barnett 2003)
- Lakehead University research:
  - Sulphide saturation mechanisms in diabasic and gabbroic intrusions in the Nipigon Embayment (Kissin 2003)
  - Stratigraphy of the Sibley Group and its relationship to sedimentary units of the basal Osler Group (Metsaranta and Fralick 2004; Metsaranta, Fralick and Rogala 2003)
  - Geochemistry and mineralogy of Nipigon diabase sills (Richardson and Hollings 2004; Richardson, Heggie and Hollings 2003)
  - Petrology and mineral chemistry of the Seagull intrusion (Heggie and Hollings 2003)
- Geographical information system (GIS) compilation of existing geological and geophysical data, including proprietary, in-kind contributions from industry partners
- Geophysical modelling over selected areas of interest
- Diamond drill core recovery and storage in MNDM remote drill core storage facility

2. Henry Halls (University of Toronto) and Greg Stott (Precambrian Geoscience Section, OGS) conducted paleomagnetic studies of mafic dikes in the vicinity of Lake Nipigon (Halls and Stott 2003, 2004), in conjunction with ongoing geochronologic studies carried out by Don Davis (Royal Ontario Museum) and Greg Stott (Precambrian Geoscience Section, OGS) (Davis and Stott 2003). These studies were designed to improve the limited understanding of the paleomagnetic and geochronologic signature of the numerous mafic dike swarms in northwestern Ontario. The association between younger kimberlitic intrusions and older dike swarms was also considered, as was identifying potential PGE-bearing target intrusions. An effort was also made to target dikes that may have served as feeders to Keweenawan mafic sills and sheets in the Nipigon Embayment.

3. Lindsay Hall (Precambrian Geoscience Section, OGS) carried out 1:20 000 scale bedrock mapping in the Opikeigen Lake area in the Fort Hope greenstone belt (Hall 2004).

4. Fred Breaks and Andy Tindle (The Open University, Milton Keynes, UK) investigated the rare-element granitic pegmatites of the Fort Hope field, west of Fort Hope (Breaks and Tindle 2004). This mapping and research was incorporated into bedrock mapping undertaken by Lindsay Hall in the Opikeigen Lake area (Hall 2004).

5. A new project was initiated in 2004 to better discriminate Archean domains and broad tectonic subdivisions within the Sachigo Subprovince (Stott and Rayner 2004). This project will focus on U/Pb age determinations and Nd-isotopic characteristics of plutonic rocks in the eastern Sachigo, including basement underlying the Hudson Bay and James Bay lowlands, in order to extend fairly well-constrained tectonic boundaries (mapped near the Manitoba border) eastwards. This work is also a contribution to the Trans-Hudson–Superior Margin Metallotect project, a collaboration between the Geological Survey of Canada and the respective provincial surveys.

6. The Ministry of Northern Development and Mines has also been actively advancing positive relationships with First Nations in Ontario's Far North in order to facilitate improved communications between these communities and mining and exploration companies. Such initiatives were designed to build capacity and understanding among First Nations in the north, in order for them to be more aware of the benefits that can be obtained through increased exploration in their respective areas (Owsiacki and Gammon 2003; Churchill and Fyon 2004; Fyon and Churchill 2003).

7. A number of faculty and student research projects have recently been completed or are in progress at Lakehead University, Thunder Bay:

Faculty Member	Research Topic(s)
Dr. Peter Hollings	English Bay Complex; Archean volcanic geochemistry
Dr. Phil Fralick	Precambrian sedimentary sequences (English River–Wabigoon–Quetico–Wawa subprovinces; banded iron formation; Sibley Group)
Dr. Graham Borradaille	Magnetic susceptibility anisotropy analyses of Proterozoic rocks in the Nipigon Basin near Armstrong

Student	Thesis Title
Bjarne Almqvist	Rock magnetism and archeomagnetism of late glacial sediments, northern Ontario (MSc thesis, in progress)
Geoff Heggie	Geochemistry and mineralization of the Seagull intrusion, northwestern Ontario (MSc thesis, in progress)
Cory Hercun	Paleomagnetism of Waweig volcanic rocks, Armstrong (BSc(Hons) thesis, in progress)
Justin Johnson	Geology, geochemistry and mineralization of the Norton Lake deposit, Fort Hope greenstone belt (MSc thesis, in progress)
Jordan Laarman	Geochemistry and mineralization of the Eva–Kitto intrusion, northwestern Ontario (MSc thesis, in progress)
Chris Lane	Mineralogy of the Rabbit Islands diatreme, Lake Nipigon (BSc(Hons) thesis, in progress)
Angelique Magee	Stratigraphy, geochemistry, petrology and alteration in the Proterozoic Pillar Lake volcanic rocks and Inspiration diabase sills (MSc thesis, in progress)
Mike Maric	Sandstone architecture of the Paleoproterozoic Rove and Virginia formations, western Lake Superior region (MSc thesis, in progress)
Riku Metsaranta	Paleohydrology of the Mesoproterozoic Lower Sibley Group, northwestern Ontario (MSc thesis, in progress)
Adam Richardson	Geochemical variation within the Mesoproterozoic Nipigon diabase (MSc thesis, in progress)
Adrienne Hanly	Diagenesis, stratigraphy, paleohydrology and lead isotope study of the Proterozoic Sibley Group (PhD thesis, Queen's University, Kingston, Ontario)

Table 5. Publications received by the Thunder Bay North Resident Geologist's Office in 2004.

Title	Author(s)	Type and Year of Publication
Desulphurization of Placer Dome's Musselwhite Mine gold cyanidation tailings	T. Yalcin, M. Papadakis, N. Hmidi and B. Hilscher	CIM Bulletin, v.97, no.1084 (2004)
Geochemical systematics of tholeiites from the 2.86 Ga Pickle Crow assemblage, northwestern Ontario: Arc basalts with positive and negative Nb-Hf anomalies	P. Hollings and R. Kerrich	Precambrian Research, v.134 (2004)
Heat flow in the Nipigon arm of the Keweenawan rift, northwestern Ontario, Canada	H.K.C. Perry, C. Jaupart, J.-C. Mareschal, F. Rolandone and G. Bienfait	Geophysical Research Letters, v.31 (2004)
The Onaman prospect, Ontario: An unusual occurrence of Cu-bearing Au mineralization in a shear zone	O. Grondon and A.E. Williams-Jones	Economic Geology, v.99 (2004)
A structural reappraisal of the Beardmore–Geraldton belt at the southern boundary of the Wabigoon Subprovince, Ontario, and implications for gold mineralization	B. Lafrance, J.C. DeWolfe and G.M. Stott	Canadian Journal of Earth Sciences, v.41 (2004)
Insights on Archean continent—ocean assembly, western Superior Province, from new structural, geochemical and geochronological observations: introduction and summary	J.A. Percival and H. Helmstaedt	Precambrian Research, v.132 (2004)
Convergent margin tectonics, central Wabigoon Subprovince, Superior Province, Canada	J.A. Percival, V. McNicoll, J.L. Brown and J.B. Whalen	Precambrian Research, v.132 (2004)
Basement terrane correlations and crustal recycling in the western Superior Province: Nd isotopic character of granitoid and felsic volcanic rocks in the Wabigoon Subprovince, northern Ontario, Canada	K.Y. Tomlinson, G. M. Stott, J. A. Percival, and D. Stone	Precambrian Research, v.132 (2004)
Tectonic and metallogenic importance of an Archean composite high- and low-Al tonalite suite, western Superior Province, Canada	J.B. Whalen, V.J. McNicoll, A.G. Galley and F.J. Longstaffe	Precambrian Research, v.132 (2004)
Geochemical and isotopic (Nd–O) evidence bearing on the origin of late- to post-orogenic high-K granitoid rocks in the western Superior Province: implications for Late Archean tectonomagmatic processes	J.B. Whalen, J.A. Percival, V.J. McNicoll and F.J. Longstaffe	Precambrian Research, v.132 (2004)
Geochemistry and geodynamic implications of the Mesoproterozoic English Bay granite–rhyolite complex, northwestern Ontario	P. Hollings, P. Fralick and S. Kissin	Canadian Journal of Earth Sciences, v.41 (2004)
Eabametoong First Nation glossary of geological and mining-related terms	Eabametoong First Nation and Ontario Geological Survey	Miscellaneous Paper 170 (2004)

Table 6. Mineral deposits not being mined in the Thunder Bay North District in 2004.

Abbreviations

AF	Assessment Files
CMH	Canadian Mines Handbook
GR	Geological Report
MDC	Mineral Deposit Circular
MDIR	Mineral Deposit Inventory record
MLS	Mining Lands, Sudbury
MR	Mining Recorder
NM	The Northern Miner
OFR	Open File Report
PC	Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References*	Status
Arseno Lake (53B14/NE)	Zn, Pb, Cu, Ag	1 million t @ 8.7% comb. Zn-Pb, 1.5 opt Ag	Northern Dynasty Minerals Ltd. (37.5%) (CMH 2004-2005, p.318)	1988 Annual Report Northern Dynasty Explorations Ltd.	Seeking joint-venture partners for further exploration
Big Trout Lake (53H12/SW)	Pt, Pd, Cr	Not available	Platinex Inc.	N/A	Option agreement to earn 50% interest signed by Brigadier Gold Limited, December 2004
Brookbank (42E12/NW)	Au	1.325 million t @ 7.4 g/t Au indicated, 0.931 million t @ 7.0 g/t Au inferred	Ontex Resources Ltd. (CMH 2004-2005, p.325)	Ontex, news release (March 26, 2003)	Discussions ongoing
Dobie Zone (52O06/NE)	Au	301 000 t @ 5.5 g/t Au	Commander Resources Ltd.	OFR 5869, p.161-162	Re-staked in 2002
Goss Lake (Frond Lake) (52P09/SW)	Au	300 000 t @ 6.7g/t Au	Landore Resources Inc. (optioned from Tandem Resources Ltd. & Yangarra / Ayrex Resources Ltd.); CMH 2004-2005, p.258	www.landore.com	2003-2004 ongoing exploration program as part of Miminiska Lake property
Headway Coulee (42L04/SE)	Zn, Ag	250 000 t @ 4.44% Zn, 1.32 opt Ag	N. Cox, M. Holt	OFR 5630, p.41	Diamond drilling and stripping – Big Mac zone 1995. Geophysics 1997
Howells Lake (52P10/SW)	Au	83 000 t @ 0.07 opt Au (+1.37% Sb) and 660 000 t (+3.1% Sb) with erratic Au values	Barrick Gold Inc.	OFR 5926, p.68	Last active in 1988.
Jacobus (42E13/SE)	Cu, Ni	1 million tons @ 0.94% Cu+Ni	N.W.T. Copper Mines Limited (CMH 2004-2005, p.298)	CMH 2004-2005, p.298	Diamond drilling by SEG in 1993. Deposit open down-plunge.
Juneau Lake (B4-7 Deposit) (42L05/SW)	Ni, Cu, PGE	2.1 million tons @ 0.87% Ni, 0.59% Cu	Landore Resources Inc. (CMH 2004-2005, p.258)	www.landore.com	Diamond drilling 2003; airborne geophysics 2004
Karl Zeemel (53B09/SW)	Au	N/a	Placer Dome Inc.	N/A	Held by Placer Dome Inc. in 2004
Kasagiminnis Lake (52O08/SW)	Au	2.9 million t @ 5.8 g/t Au	McVicar Minerals Ltd.–Asia Now Resources Limited (CMH 2004-2005, p.278)	NM Apr. 18, 1988	Acquired 2002. Airborne magnetic survey flown in 2004
Key Lake (42E11/NE)	Au	Indicated resource potential of 200 000 oz per 100 vertical metres	Roxmark Mines Limited (CMH 2004-2005, p.368)	CMH 2004-2005, p.368	Exploration last conducted in 1996-1997
Koval–Ohman (52O07/SE)	Au	471 589 t @ 5.81 g/t Au	Barrick Gold Corp.	OFR 5869, p.317	Inactive

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References*	Status
Lavoie Lake (43D05/NE)	Cu, Ni	14.6 million t @ 0.58% Cu, 0.37% Ni	Aurora Platinum Corporation (CMH 2004-2005, p.62)	OFR 5926, p.101	Acquired 2002
Lynx Canada (42L04/SE)	Cu, Ag	25 000 t @ 4.0% Cu, 300 000 t @ 2.0% Cu, 1.0 opt Ag	N. Cox, M. Holt	OFR 5630, p.41	Diamond drilling and stripping – Big Mac zone 1995
Magnet Mine (42E11/NE)	Au	147 916 tons @ 0.45 opT Au; 747 976 tons @ 0.49 opT Au above 11th level	Roxmark Mines Limited (CMH 2004-2005, p.368)	CMH 2004-2005, p.368	Advanced exploration in 2001
Marshall Lake (42L05/NE)	Cu, Zn, Ag, Au	2.211 million tons @ 1.22% Cu, 4.2% Zn, 2.45 oz. Ag per ton, 0.012 oz. Au per ton	N.W.T. Copper Mines Limited	CMH 2004-2005, p.298	Diamond drilling 1996–97. Reinterpretation 1997, 2000.
Mimmiska Lake (52P09/SW)	Au	Inferred resource of 346 900 t @ 5.3 g/t Au	Landore Resources Inc. (CMH 2004-2005, p.258)	www.landore.com	Diamond drilling 2003-2004
Norton Lake (42M14/NW)	Ni, Cu	944 500 t @ 0.72% Ni, 0.56% Cu	East West Resource Corporation–Cascadia International Resources Inc. (CMH 2004-2005, p.150)	www.eastwestres.com	Geophysics, geochemistry; diamond drilling 2003-2004
Paulpic (42L04/NE)	Au	200 000 t @ 0.231 opt Au	Canada Tungsten Inc.	OFR 5630, p.465	Last active 1987
Pickle Crow Mine (52O09/SE)	Au	1 182 200 Tons @ 0.22 opT Au	Wolfden Resources Inc. (Pickle Crow Gold Mines Limited) (CMH 2004-2005, p.451)	www.wolfdenresources.com	Mill construction, ore stockpiling - No 1 & No. 5 veins by Cantera Mining Limited; currently inactive
Thierry Mine (52O08/NW)	Cu, Ni, PGE	15.5 million t @ 1.92% Cu	PGM Ventures Inc. (CMH 2004-2005, p.338)	UMEX 1982; www.pgm-ventures.com	Joint-ventured with Peabody Capital Partners Corp (now Richview Resources Inc.), January 2004; drilling 2004-2005
Umex–Dorothy Lake (52O06/NW)	Au	236 220 t @ 6.17 g/t Au	K. Kukkee; optioned to Canadian Golden Dragon Resources Ltd.	OFR 5869, p.260; NM, June 11, 1990, p.13	Staked 2004; optioned January 2005
Zulapa (42M12/SW)	Au	700 000 t @ 0.28 opt Au to 200 m	Eabametoong (Fort Hope) First Nation	OFR 5926, p.208	Inactive (within FN boundary)

*N.B. This table contains tonnage and grade estimates, referred to as "reserves" (indicated, possible, probable), which were determined at various times by methods largely unreported. It is not known if any or all of these estimates are in compliance with the reporting standards required by National Instrument 43-101.

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

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